AMERICAN GAS JOURNAL

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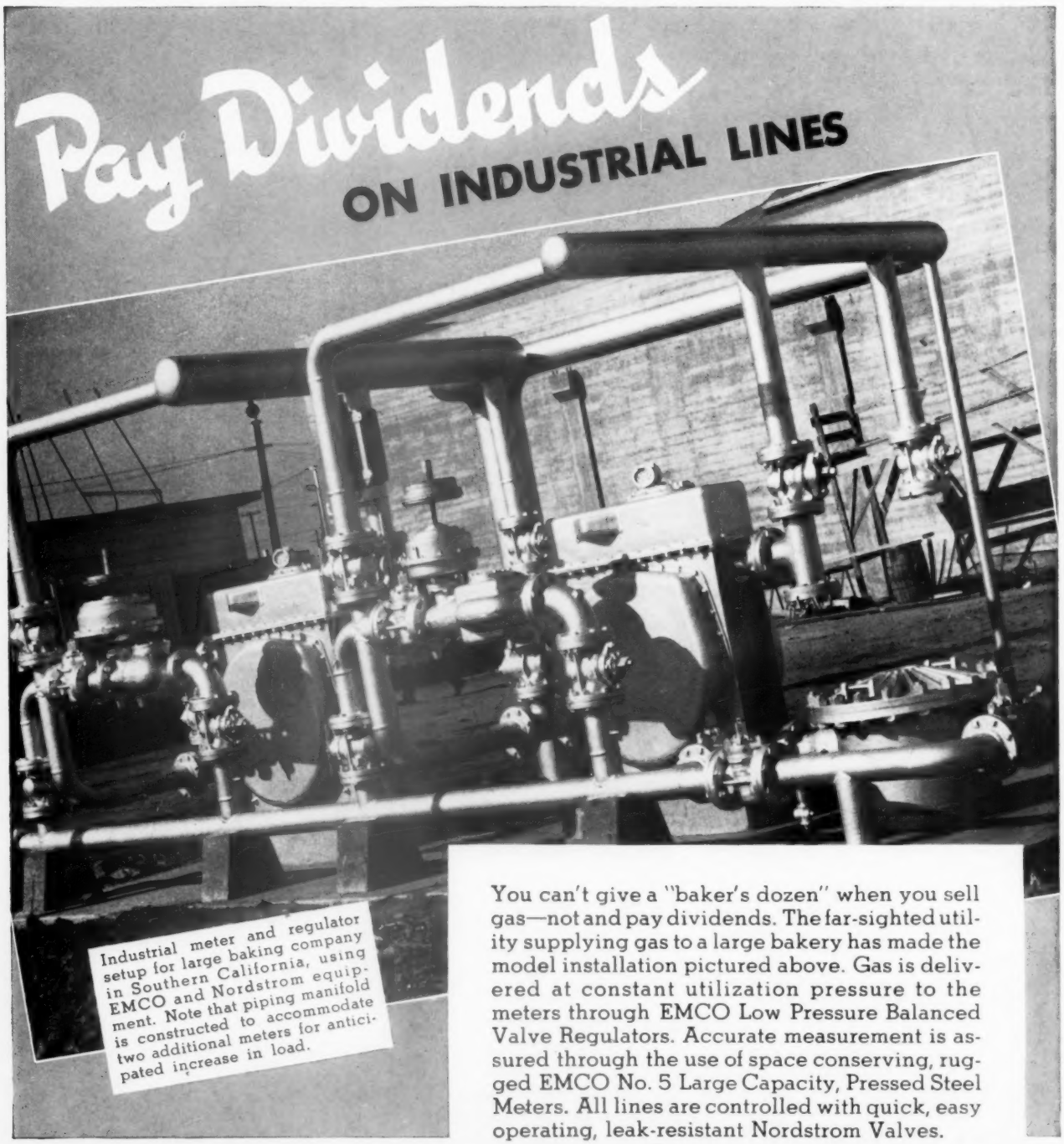

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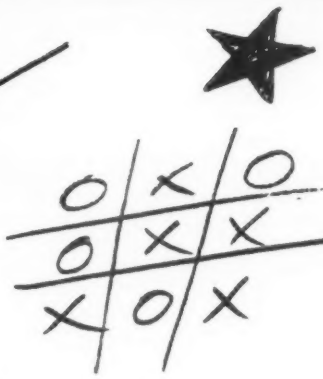
Coal Fired Bowling Green 9.3536



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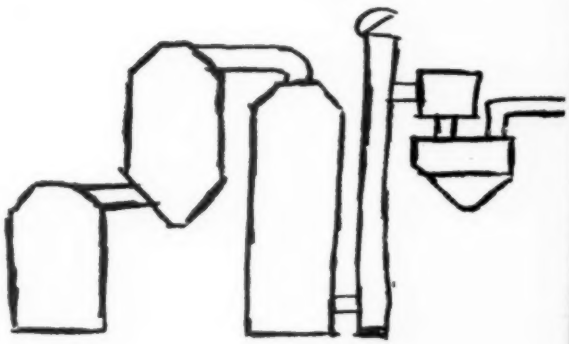

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MARCH
1940

AMERICAN
GAS JOURNAL

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Gas Injury to Trees

By
Homer L. Jacobs
Kent, Ohio

WORDS of appreciation are perhaps spoken more often for the cooling summer shade of our city trees than for the warmth, comfort and convenience supplied by the gas lines. Yet the average home owner would find it difficult to decide which to give up if he or she had to make that choice. Most home owners know that leaking gas may become one of the difficulties in growing trees under city conditions. This is recognized also by those engaged with gas distribution problems.

Unfortunately, not being specialists in tree care, neither property owners nor gas officials are entirely familiar with other ills which affect trees although both realize that trees do sicken and die from causes other than gas injury. There are two sides to the subject. This article is intended to discuss both gas injury and some other troubles which may be responsible for the condition of trees suspected of being gas injury victims.

In discussing gas injury to plants, a distinction should be made between manufactured or illuminating gas and natural gas. Some of the literature on the subject leaves the impression that only the former is liable to be injurious. Although horticulturists generally recognize the greater toxicity of illuminating gas there is ample evidence to indicate the danger to plants of an accumulation of natural gas in the soil.

Illuminating gas varies in composition but for our purpose may be described as a mixture of gaseous compounds some of which are highly toxic, some of which are but slightly toxic, and some perhaps not at all except as they may displace oxygen necessary for plant growth.

Courtesy F. A. Bartlett

Three Causes of Gas Injury

Many theories have been advanced for the causes of illuminating gas injury to plants. Three of these seem to be well established. First, and perhaps most important, is the toxicity of hydrocyanic acid found in a mixture of gas and soil moisture. Second, is the effect of the ethylene content of the gas and, third, lowering the oxygen content of the soil air.

The first two have been the subject of extensive research by Dr. William Crocker and his co-workers at the Boyce Thompson Institute for Plant Research at Yonkers, New York. The carefully planned experiments of these men have shown that hydrocyanic acid gas and ethylene gas are the most important factors in injury from illuminating gas. For our knowledge of the subject horticulturists are indebted to them.

Illuminating gas is definitely toxic to plants even when plenty of air is admitted to the soil at the same time. Furthermore, when a number of the other compounds found in the gas are, by themselves, introduced into the soil about plants no injury occurs. However, when illuminating gas, scrubbed free of hydrocyanic acid gas with alkali hydroxides, is

Courtesy Davey Tree Expert Co.

Left: Trees Dying From Dayton Elm Disease. Street trees have been the most frequent victims of this disease which has killed thousands of elms in the Ohio River Valley during the last twelve years. It is caused by a parasitic agent unrelated to the soil contents.

Right: Street Trees. This pictures the difficult environmental conditions under which many street trees exist. Note restricted root area, dead limbs and trunk scar in elm in center foreground.

passed through the soil it is many times less toxic than unscrubbed gas.

Hydrocyanic acid gas injury is caused not alone by this compound in a gaseous state. The residue left in the soil is poisonous after the gas flow has been discontinued and the gas removed from the soil. This poisonous effect may remain for some time although it gradually disappears. Where the soil is porous and drains readily, leaching with large quantities of water will hasten removal of the dissolved poisons.

The injurious properties of illuminating gas which has been freed of hydrocyanic acid gas are due to the presence of a number of compounds of the unsaturated hydrocarbon group. Of these ethylene, propylene, acetylene and butylene are known to be harmful. Since ethylene is present in larger quantities than either of the others it is believed to be second in importance to the hydrocyanic compound as a cause of plant injury. However, ethylene becomes even more important since it causes one of the few specific symptoms of injury and causes a reaction by means of which the presence of illuminating gas in the soil, in extremely small quantities, can be detected.

Exposure to large quantities of illuminating gas, even for a few hours, may bring about rapid breakdown of the roots and death of the tree in such a way that it is difficult to distinguish from the result of root destruction from other causes—especially if examination is not made promptly. Discoloration of the roots, ranging from bluish gray to black, may be found. The bluish tint sometimes extends into the sapwood of the buttress roots. Leaves may wilt and fall while still green or may turn brown and remain on the tree.

Odor a Symptom

A characteristic odor is sometimes reported to be an identifying symptom of a tree killed in this manner. However, this odor is difficult to describe and is of little value in diagnosis unless one person comes in contact with enough definitely gas killed trees to enable him to recognize it through his own experience.

The presence in the soil of comparatively small amounts of illuminating gas over a long period of time may cause a chronic condition of ill health which is difficult to distinguish from that caused by drought, poor soil or other environmental trouble. Sometimes mild cases of injury result in a yellowing of the leaves and a turning downward of the leaf stems, called epinasty. This epinastic growth is due to stimulation by ethylene which causes more rapid cell division on top of the leaf stem than takes place on the under side. The result is a drooping appearance to the leaf blade although no wilting has taken place. This is not always present but should be looked for since it is one of the few definite symptoms of gas injury which may be found.

Turning downward, or epinasty, of leaves, affords a simple and sensitive test for the presence of illuminating gas in the soil air. The epinastic growth described above refers to the effect on leaves of trees, the roots of which are growing in gas laden soil. However, the leaves of some plants are so sensitive to ethylene that they respond to its presence in quantities too small to be detected by the finest chemical methods. Illuminating gas, because of its ethylene content, may cause epinasty when present in as small an amount as one part in one hundred thousand parts of air.

The Tomato Plant Test

Vigorously growing potted tomato plants are used to aid in diagnosing suspected cases of gas injury to trees. While such plants are not always available they are often obtainable in many localities, from commercial growers of greenhouse tomatoes or garden plants, over a period of several months each year. Workers who meet with this problem frequently can arrange to have a few plants available at small expense whenever needed.

To make a test with such a plant, dig a hole into the soil to a depth of two or three feet. Hang the potted tomato plant near the top of the hole but below the ground surface. Then cover the hole tightly to prevent loss of gas which may accumulate. If the temperature within the hole is high enough for growth, and illuminating gas is present even in minute proportions, the leaf-stems will turn down within twenty-four hours.

Remember that this test is based on response of the leaves. Roots of trees are not liable to be injured at the lower concentrations which cause epinastic growth of tomato leaves. Consequently, if this test gives no response it is definite evidence that illuminating gas was not present in quantities great enough to cause injury to the tree at the time the test was made.

The gases which make up the mixture known as natural gas are slightly, if at all, toxic to the roots of plants. Death of shrubs and trees following an accumulation of natural gas in the soil is probably due to toxic soil conditions produced by

displacement of soil oxygen with resulting changes in bacterial and other soil processes. The symptoms are the same as those found in poorly drained or submerged soils. Similar conditions are found in trees dying from fills over the roots in clay soils.

Saturation of the soil—especially a clay soil—with natural gas results in a bluish gray to black color together with an odor usually associated with stagnant, poorly aerated mud containing some organic matter. The tree may be killed, or only slightly injured with recovery taking place later. The bluish discoloration in roots or sapwood, previously mentioned, is usually present.

Other Destructive Agencies

Nothing will take the place of the exercise of a large amount of common sense in determining whether gas was or was not the cause of death of a tree. This can be done best by an observant person who is thoroughly familiar with tree troubles which may cause similar symptoms. Because the symptoms of gas injury are none too distinct a careful examination of other trees of the same kind, in the same neighborhood, sometimes shows that the trouble is common to all of them and so is due to other agencies.

The tree expert can often be of service to the gas company as well as to the tree owner. Perhaps it is only natural that the owner sometimes suspects gas injury as the cause of tree decline because nothing else is evident to the untrained eye. This is particularly true after a gas leak has been repaired nearby. The property owner may look over his trees carefully for the first time and attribute to gas injury troubles which were present long before. Officials who are specialists in gas distribution, and not tree care, sometimes pay for good will, and to avoid litigation, when examination by a tree expert might have shown diseases, insects or soil conditions to be responsible.

This is illustrated by a case from the files of the Davey Tree Expert Company from which the writer, who made the diagnosis, is privileged to quote. At the request of a gas company an examination was made of a street tree claimed to have been injured by a gas leak which was located and repaired some months before. The claim agent said that he believed the gas leak was responsible and that if this diagnosis agreed the company expected to replace the tree or pay for it. The tree was in the condition of so many silver maples in street plantings. It had been repeatedly and severely topped; the trunk bore the scars of many years of battling with lawn mowers, automobile bumpers and hub caps; underneath large areas of dead bark, flatheaded borers were thriving and showed evidence of having been present for two or more years. The southwest side of the trunk was flattened from years of slow growth on that side due to sunscald.

In other words, the trunk showed all the signs of physical disintegration common to such street trees, but these signs had come to the attention of the owner only after the gas leak was repaired. And yet the vegetative condition of the tree clearly showed that the roots were vigorous and undamaged. Leaves were large and of good color. Branch growth was excellent, some twigs having made two to three feet of growth since the leak was repaired. If the tree had been gas-injured, the roots, and consequently leaf and twig growth, would have suffered promptly. When these findings were reported in detail the complaint naturally assumed a different status.

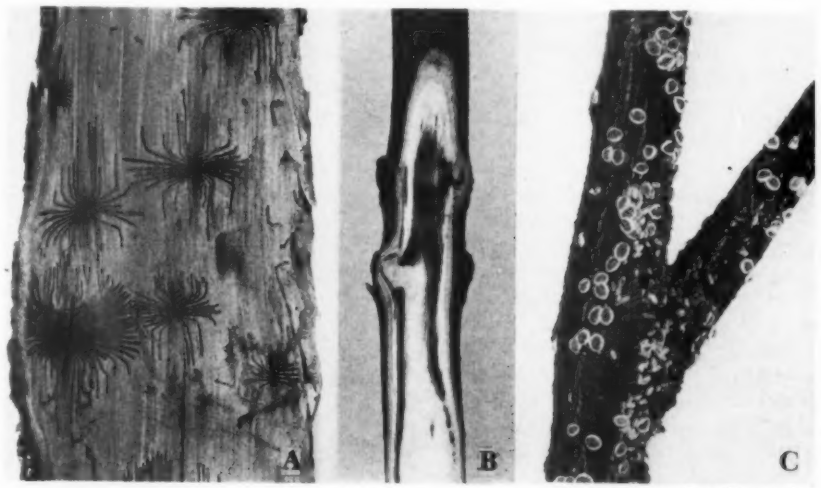
Insect Pests

Rapid wilting or collapse of a tree, resembling severe injury from gas, may be due to a number of other causes. Among these is the work of bark borers, which are the feeding grubs of many species of beetles or other insects. Some of the most vicious borers are so small that they escape notice until death of the tree is imminent. Most of them prefer to attack trees already in low vitality. In such trees they multiply rapidly. Too severe pruning, or breaking of limbs in storms, exposes trunks and large limbs to sunscald and makes conditions quite favorable to borer attack.

Some adult beetles lay a hundred or more eggs—and there are two or more broods a year—so that the number of borers present in a tree increases at an amazing rate. The cutting of sap channels by a brood of feeding borers often destroys an astonishing amount of vital tissues in a short time. One borer of some species makes a winding burrow as much as five feet long. The channels of some of the smallest, but not the least destructive, species are not more than two inches long. The adults of one kind of beetles, the engravers, seem to be able to space the egg galleries so that the tunnels of the grubs will not overlap—thus making sure that the young from each gallery can cause the maximum amount of injury to the tree.

Sudden wilting in midsummer also takes place from injury which occurred the preceding winter. There is on trees near the groundline an area of bark and sapwood that is more susceptible to freezing to death of the cells than the remainder of

(Continued on page 44)



Courtesy Davey Tree Expert Co.

(A) Bark Beetle Brood Galleries in Sapwood of Hickory Tree. Each burrow is short but the sap conducting tissue was destroyed by the large number of borers which grew in this tree. This photograph shows burrows of at least 200 borers which grew from the eggs laid by eight adult beetles.

(B) Symptom of Wilt in Maple or Elm. Greenish or brownish streaks in dying branches are symptoms of elm and maple wilt.

(C) European Elm Scales. Although more conspicuous than most scale insects these are typical of a large group of sucking insects which contribute to the ill health of shade trees.

The Use of Gas for Firing Galvanizing Kettles

By
Fred C. Dietrich
Pacific Gas & Electric Co.

IT IS SAID, "The proof of the pudding is in the eating." The theorem that the use of gas in industry excels all other fuels might also be stated, "The proof of the superiority of gas is in the using." Mr. E. K. Cooley, owner of the San Francisco Galvanizing Works located at 1176 Harrison Street, San Francisco, California, can well attest to this statement by reason of his experience in the use of various fuels in the galvanizing industry.

As far back as February, 1906, Mr. Cooley pioneered in the use of gas for firing galvanizing kettles by equipping his original kettle with a system of double row bunsen type burners firing directly against the sides of the kettle through ports provided in the brick work.

At that time manufactured gas of 550 Btu content was supplied in this territory at a comparatively high rate per thousand cubic feet, no industrial rate being available. Compared to present day methods of firing kettles this installation might have been considered crude, but because of the lack of knowledge of proper burner application, coupled with the fact that the gas was burned inefficiently and at a high rate, the operating cost was considerably in excess of coke which was the fuel then most commonly used for this purpose.

Efforts were made to improve the operation of the burners, but after only a short time, during which some progress was being made, the entire plant was destroyed during the great San Francisco earthquake and fire on April 18th, 1906. Not dismayed by this loss, a new plant was built shortly afterward at the same location, but because of the inability to obtain gas on account of disrupted gas mains and the general chaotic conditions, coke was resorted to for firing the new kettle.

The use of coke was continued for several years and the industry watched carefully for any improved methods which might be coming into use. The use of fuel oil was beginning to appear on the horizon about this time and when it became necessary to install a new kettle, oil burning equipment using compressed air for atomization was installed. This change proved to be far superior to coke with a resultant lowering in operating costs. Continual improvements were being made in oil firing equipment and with subsequent kettle renewals new methods were tried. Of late years the motor driven rotary type oil burners were used with varying degrees of success.

Mr. Cooley states that with the use of oil it was necessary to annually rebuild the dutch ovens into which the burners fired and to renew the entire setting about every two years. Because of the application of the heat it was also found advisable to reverse the kettle in the setting at the end of about one year of operation to prolong the life of the kettle which averaged as a rule from eighteen to twenty-four months. During the past few years the cost of fuel oil for operating the kettle averaged about $130.00 per month. To this operating cost might also be added approximately $100.00 per year for burner maintenance and the power cost of two one-half horsepower motors for operating the rotary burners.

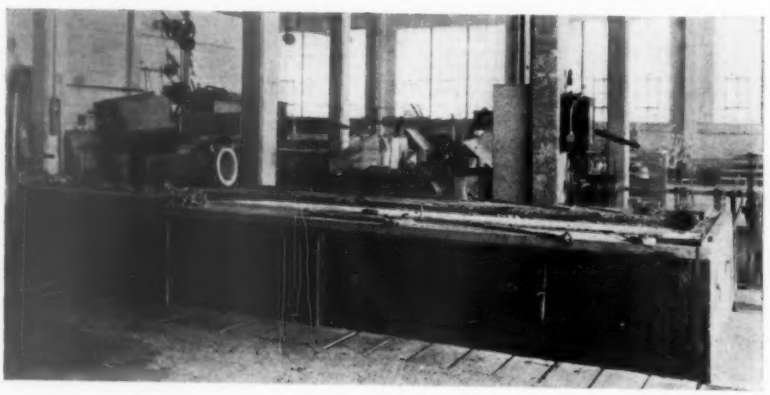


Fig. 1. General View of Kettle and Controls.

Gas Designed Job Installed

During the past several years, Mr. Cooley was constantly solicited with the idea of getting him to again use gas for his plant. With his early experiences with gas and his apparent satisfaction with the use of oil, he was obviously somewhat skeptical to make a change. A complete and thorough study was made of his existing operating conditions and plans were submitted to him incorporating the latest ideas in gas firing and furnace design. This was done prior to the time of the installation of a new kettle. Realizing the improvements made during the past few years in gas burner design and application and the availability of natural gas with 1180 Btu value, it was decided by him to install a gas designed job to replace the recently burned out oil fired kettle. This kettle was of approximately 46 ton capacity, 21 feet long overall and 3′-6″ x 3′-6″ in cross section.

The last seven feet tapered to a cross section of 1′-6″ x 1′-6″. The photograph in Figure 1 shows a general view of the kettle and controls.

In cooperation with the gas company representative, the new kettle was installed, and equipped with a gas burning system furnished and installed by the Heat Equipment and Engineering Company of San Francisco, California. These burners are known as Heeco Vertical Ribbon Flame Burners, consisting essentially of a series of burner heads, each with fifteen orifices, mounted in a line along each side of the kettle and firing vertically up through a combustion space of which the wall of the kettle constitutes one side and a 4½″ course of insulating brick the other.

Near the top and at several points

in this brick wall are ports through which the products of combustion pass and enter the flue. From here they pass under a drying stove measuring six feet wide and twenty feet long and thence into the stack. This stack is provided with a damper controlled automatically by means of the temperature control equipment. A 12″ check damper is also provided at this point.

To provide for a more uniform pressure condition to each burner head, a 2″ manifold was run parallel to them with a 1-½″ side outlet to each one.

Eight burners are provided along each side of kettle giving a total of 120 orifices. This allows for a continuous sheet of flame along the entire length of kettle. Eight pilot lights are provided on each side for proper lighting of the burners with the automatic control.

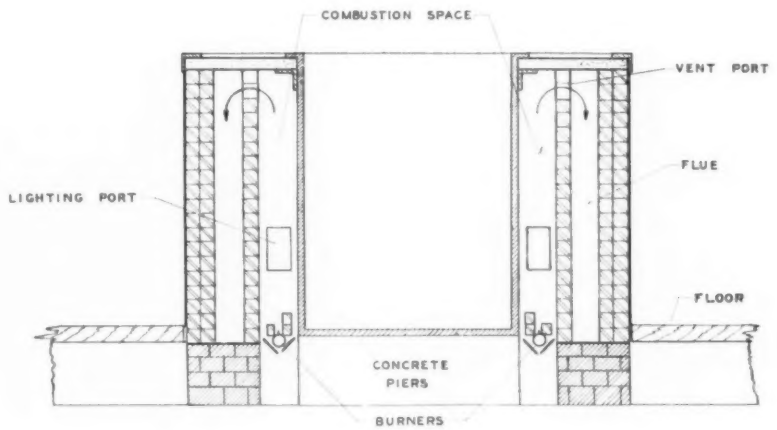


Fig. 2. Burner Application and Special Brick Setting.

The burners are mounted so that the hot zone is above the dross line thereby reducing the amount of dross formed. Figure No. 2 shows a sketch of the burner application and a special brick setting.

The burners operate on low fire at 3″ H_2O pressure and high fire at 14″ H_2O pressure.

During operation the metal in the kettle is maintained at 870 deg. Fahrenheit and during idling periods reduced to 820 deg. Fahrenheit.

Automatic Controls

A most complete system of automatic control was provided to maintain temperature and also to take care of any emergency which might arise such as power outage, or any possible irregularities caused by equipment failure.

The controls consist of three thermocouples, two immersed in the metal and one in the firebox. The thermocouple controlling the metal temperature is connected with a Potentiometer Controller and automatically governs the desired temperature of the zinc metal in the kettle. The other thermocouple in the metal is connected with a recording pyrometer which is located in the plant office for the convenience of the management and gives a continuous record of the temperature maintained.

What is believed to be an innovation is a thermocouple mounted in the firebox for limiting the firebox temperature which experimentally have been found should be a maximum of 1200 deg. Fahrenheit. By this means a gradual increase in firebox temperature is provided rather than an intense heat of short duration, thereby putting less strain on the kettle.

A firebox temperature limit control operating in conjunction with a solenoid valve causes the burners to be shut off when the maximum temperature of 1200 deg. Fahrenheit is reached. A switch provided on the control unit allows for direct temperature readings in the firebox to be taken at any time. The solenoid valve requires manual resetting by a push button controlling the relay circuit.

Vapor stat valves are provided to shut the gas supply off in case of power failure, or a pressure in excess of 1-½ pounds. The control unit is provided with a motor valve with three stage opening and closing and a cutout between stages when control is balanced. The motor valve arm directly controls a V-type gas cock and the stack damper cable.

The burners as installed were sized to give a maximum capacity of 1600 cu. ft. per hour at 1-¼ pounds pressure. This will allow a production schedule of approximately four tons per hour. The combustion test at this firing rate gave a flue gas analysis of 11.8% CO_2, 0.4% O_2 and 0.0% CO with a clear fire about 20″ high. With this high rate it was found that the firebox temperature would build up to higher than 1200 deg. Fahrenheit unless the kettle was continuously operated near its maximum production rate.

To meet with average conditions the controls were set to deliver 1200 cubic feet per hour.

At this rate the analysis showed 10.5% CO_2, 2.5% O_2 and 0.0% CO.

This rate can be lowered if desired by the operator to take care of light load conditions.

Generally an input of 1000 cubic feet per hour is considered sufficient. During operation the control throttles the fire and stack damper by intermittent stages to a minimum fire of 160 cubic feet per hour. The damper at this point is fully closed and the 12 inch check damper is wide open.

The stack temperature varies between 390 deg. and 440 deg. Fahrenheit.

Several kettles fired with gas in this area have proven that kettle life is at least doubled over those fired with oil. In one instance it was not necessary to replace a kettle for a period of five years.

Mr. Cooley is very enthusiastic about the operating results of his new installation and finds that it operates cheaper than former kettles fired with oil. The surprisingly low average of $128.00 per month has been maintained during the past several months.

Arrangements are now being made to provide an insulated cover for the kettle to be used during nights and week end periods. This will further reduce the operating costs materially. The expense of maintaining a watchman during these periods has also been eliminated by means of the automatic control.

It has been proven that many advantages are possible with the use of gas.

Enumerating some of these advantages we have, longer life of kettle, fully automatic control, less attendance, lower operating cost, no furnace or burner maintenance, reduction in dross formation, no night or week end attendance, elimination of smoke and soot, a more satisfied operating personnel and a better product.

The Selling Parade

A Digest of Successful Selling Ideas

By
Charles B. Roth

THE VICE PRESIDENT IN CHARGE of sales for a large jobber is a dour old fellow who never smiles, who never praises. Yet his men love him. They love him because of his justice and honor, love him for his truthfulness and integrity.

The branch manager was telling me the other day of his latest experience with the big boss. The branch manager had just engaged half a dozen salesmen with whom to open up a new territory. The vice president was going to be in town in a few days, so the branch manager said he decided to have the boss look over his new men.

They had a little luncheon at the athletic club, and when it was over the vice president took the branch manager aside and told him: "There's only one man in that group who will make the grade. Get rid of the others right away or it will cost you money."

His pride hurt, the branch manager wanted to know what was the matter with his choices.

"And then I got a lesson in salesmanship I hadn't ever been able to pick up by myself from my own experience," he told me. "It did me no end of good."

"What lesson was that?" I asked him.

"That the quality of the men must be as good as the quality of the merchandise, or they can't sell," he replied, and continued:

"The vice president told me, 'Those men you picked out aren't quality men. They are price men. They would do very well selling a line based on price. Ours isn't. A salesman has to be in the same class as his goods, but you are trying to get Class B men to sell our Class A goods. It won't work, Bob.'

"I saw the point in a jiffy. I had been too hasty in choosing my men. So I revised my sales force, let all but one of my new men go and tried to get men who I thought would live up in their lives and selling to the goods they sold."

"And that worked, didn't it?" I asked him.

"Worked? I'll say it worked. Why, the old man almost smiles when he opens the orders I send him."

* * * * * *

Before he went into salesmanship the president of a large insurance company was an engineer—a man who imagined, as the gifted O. Henry had one of his characters say, in facts. The habits engendered by long years of engineering experience will not leave. Therefore he puts everything on a factual, on a scientific, on a mathematical, on an engineering basis.

A few months ago he called in his vice president in charge of the sales department. He asked one question: "Can you paint me the portrait of a million-dollar life insurance salesman? In words, I mean."

"Well, if you put it that way, I do not think I can," said the vice president frankly. "But I know what you want, and I will get it for you—a blue print of the things that make a man a million-dollar producer, is that it?"

"That's it. Fine. Get it as soon as you can."

Out of that request came the picture, so far as I know the first picture, of a million-dollar salesman. For the vice president went to all the million-dollar men of his company, an asked them very pointed and personal questions about themselves and their selling practices. When he was through he had the composite million-dollar man.

You are not in the insurance business, but the qualities of these million-dollar salesmen will help you to sell more. So let me introduce you to this million-dollar gentleman now.

He calls on strangers and friends alike, for he believes that a salesman has to keep his life filled with new human contacts to get a satisfactory amount of business. He averages seven good substantial sales calls every day.

He makes appointments in advance, half of them by telephone, half of them in person. He believes that contacts are 50% important in making sales; knowledge, 25% important; effort, 25% important.

He sets an allotment for himself, by the year, month, week—and works to make it. He entered the business at the age of 29 and has averaged 12 years in it. It took him six years of hard-plugging before he had his first million-dollar year.

In other words, here is the picture of an ordinary man who, by doing ordinary things well, became a million-dollar producer. You didn't find anything in the portrait that is much different from what you see in other salesmen every day, did you?

The secret of the million-dollar salesman is that he does the things which other salesmen all know they ought to do, but never get around to doing.

* * * * * *

A plain woman I know was telling me that she considers the worst crime of salesmen toward customers is the crime of insincerity.

Whenever she goes into a store to buy, she says, the sales people come out and with great show of rapture tell her how beautiful she is, how lovely she looks, how handsome the hat makes her profile appear.

"It's all horse feathers," said she. "I know it. They know it. But they think that they have to lie, lie, lie to make sales. Why don't their sales managers instruct them in the art of being sincere?"

I don't know the answer to that one. But this I do know, that it is important. Whenever you tell a customer something he knows isn't true.

that is flattery, which everyone resents. Whenever you tell a customer something nice that is true, however, it is a compliment, which we all like. There is no higher form of selling strategy than the use of the compliment, but when it degenerates into flattery there is no lower form.

The difference is—sincerity.

* * * * * *

I have been re-reading one of my favorite books; a strange book about strange characters undergoing strange and wild adventures in the England of a century ago. Maybe you have read *Lavengro* by George Borrow too? If you haven't, I really envy you the thrill of reading him the first time.

What a fascinating, rollicking story it is, and how filled with unusual men and women, with what strange talk and philosophy, with what high adventure! Sherwood Anderson, great American novelist, has said that he considers George Borrow to be the most skilled story-teller ever to write in the English language. This may be carrying admiration a bit far, but you have my unqualified recommendation of *Lavengro* any time you want to read it.

Of course, I can find lessons on selling and ideas for salesmen in everything I pick up, just as a minister can find texts for complete sermons in every verse of the Bible. And I find many things in *Lavengro* which a salesman could use.

For instance, there's the downhearted landlord. He stands for every discouraged salesman. Business at his public house was pretty bad. He owed his brewer, and his packer, and everybody else. As a result, he was a man without heart.

Some of his not too gentle customers discovered this. They began browbeating him. They charged drinks and when he asked for payment they made fun of him.

He was in such a low state of heart when Lavengro (George Borrow himself was called Lavengro by the Gypsies; it means "word-master") entered his place. The landlord poured out his heart. Borrow asked him why he didn't bash one of the rowdies in the face.

"Why? Why reason enough," said the landlord. "I hadn't the heart with one blow of my fist into his face, to send his head ringing against the wall. For when a man's pocket is low do you see his heart ain't much higher?"

Borrow counselled him to stand up and fight like a man, not to cower and cringe like a whipped cur. Borrow left for another part of England.

It was several weeks before he returned. But what a change! The place was prosperous. The customers were treating the landlord with great deference, and were paying for their drinks. The young man asked what had happened, and found out that the landlord had taken his advice, and had knocked down one of his insulters. Thereupon the crowd turned for him—and prosperity was his.

* * * * * *

The moral for a salesman is, not that he go around bashing his customers in the face when they insult him, but that he stand up and fight hard against the fates when they want to keep him down.

A friend of mine is ace salesman for a large office supply firm. He recently made his largest sale of steel filing cabinets. He was telling me how he did it.

"This prospect is a large buyer but an awfully close buyer," said he. "I had been trying for a year to get the business. It was always price, price, price whenever I called. He bought filing equipment of the cheapest possible kind. Another big deal was up, and we were going round and round as usual on price.

"I know it's always dangerous to knock a competitor's goods. But I did it. And that's how I got the order."

I admitted that if he got the order it must have been good salesmanship, but I couldn't see how he could knock a competitor and carry an order for higher priced goods.

"Tell me the details, won't you?" I asked.

"Well, I went in and put on a little show. In the full view of the office force, I walked up to one of the cheap filing cases and banged it with my open hand. It rang like a cracked bell. Then I said: 'T.C. T.C.'

"The boss, curious, maybe dumbfounded too, asked: 'What do you mean "T.C."?'

" 'Tin can,' " I replied. 'Tin can. That's what these files are made of—tin cans.' "

"What did he say then?" I wanted to know.

"He said: 'You win. How soon can you get some good ones over to me—not "T.C.'s"?' 'Tomorrow at nine,' I said. That closed the deal."

The point of it is that the salesman knew when it was safe to point out a buyer's foolish economy by making it appear absurd. His humor robbed the situation of the usual hazard that comes when you knock somebody else or his goods.

Story from a British magazine: The salesman's dinner was in full swing. Suddenly there arose a round of ringing applause. A man on the outside asked the doorkeeper:

"I say, what's all the noise about?"

"Oh," replied the doorman, "the chairman has just introduced a salesman who sold Mussolini a book on self-confidence."

Plans for Southwestern Gas Measurement Short Course

More than 600 persons from all sections of the nation are expected to attend the sixteenth annual Southwestern Gas Measurement Short Course which will be held at the University of Oklahoma April 16, 17 and 18.

All plans for the annual gathering were set up at a meeting of the General Committee at the University on January 19. Fay C. Walters, Panhandle Eastern Pipe Line Company, Kansas City, General Chairman, presided at the morning session, and R. L. Rountree, United Gas Pipe Line Company, Houston, Texas, Chairman of the Program Committee, presided at the afternoon session.

During the past 15 years the meetings have attracted 7,722 persons. Five hundred and sixty-two persons from 26 states attended the school last year. Six hundred and fifteen companies have sent representatives to the short course in past years.

Except for a banquet session, the delegates spend their time in classes because they must follow a regular schedule each day. During their stay at the University of Oklahoma they hear discussions and lectures on problems pertaining to the measurement and regulation of dry and casinghead gas. Leading manufacturers exhibit the newest developments in equipment.

To stimulate interest in the short course, prizes are awarded those who write the best papers on what they learned during the two-day meeting.

Developments in the Conditioning Of Boiler Feed Water

Part II

By
E. F. Walsh
The Narragansett Electric Co.,
Providence, R. I.

Evaporators can be eliminated which requires, in most cases, treatment of the water within to prevent scaling. Some solids are bound to carry over into the system from this equipment. Power plants located at tide water use sea water or a contaminated water for cooling purposes. Condenser leakage makes its way into the feed water and has to be treated. An efficient external conditioning plant can be installed that will remove from the condensate and the necessary makeup water all scale-forming salts and in the event of a condenser tube failure the condensate can be discharged to waste and 100 per cent makeup used which will produce satisfactory operation until such time as the equipment can be shut down for repairs. With the conventional setup, a condenser tube failure usually results in a shutdown within a very short time after the failure. This may result in a load loss at a time when it is least desired.

A typical heat balance and equipment layout is illustrated in Fig. 10. Following the diagram in Fig. 10 which would be for normal operation, the condensate would flow from the surface condenser through the three-way valve (1) passing through heater (D) to treating tank (C), the flow course represented by heavy line. The makeup city water would enter through float valve (4) indicated by heavy line, entering top of the treating tank, passing through tank where it would be treated to remove all scale-forming salts, then through filters and back to outer shell of treating tank, mixing with the condensate at point (5), where the total water for boiler feed purposes would be heated and deaerated. The portion of the tank (C) indicated by (6) would act as the surge tank and can be of any capacity desired. The condensate would not be treated in this cycle. The water would then flow from this point through the balance

Erratum. In part I of this article (Feb. issue) the formula (2) page 14 should read:—

$$CaSO_4 + H_2Z \rightarrow CaZ + H_2SO_4$$

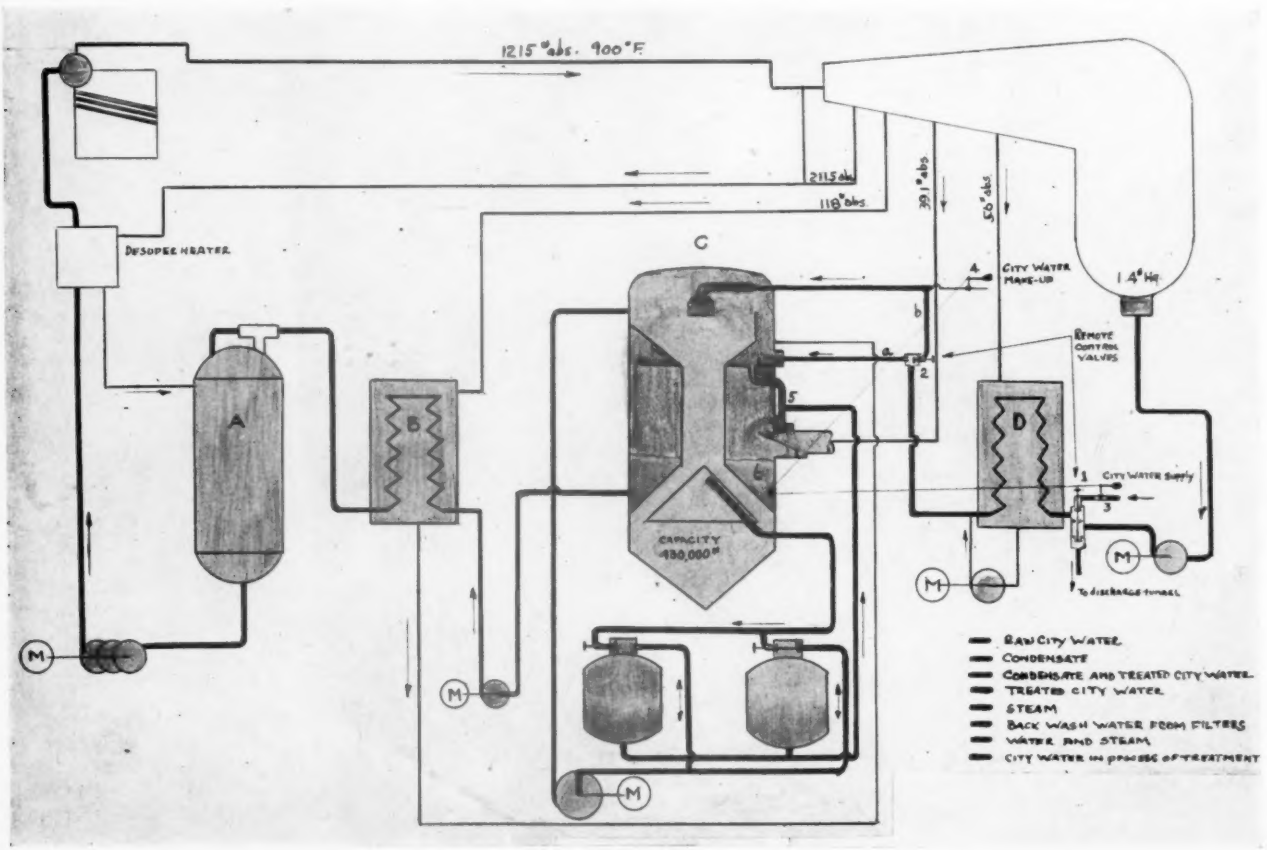


Figure 10.

of the cycle as indicated.

Let us assume that leakage in the surface condenser has reached a point where the condensate is not of a desirable character to be used as untreated boiler feed water. The operator would then cause the remote control valves (1) and (2) to operate—or they could be operated automatically from the salinity meter in the condensate line. The operation of these valves would cause all or part of the condensate to be dumped to the sewer admitting sufficient raw makeup water to offset the amount dumped resulting in all of the boiler water to be conditioned.

City water alone or a combination of raw makeup water and condensate would enter through valve (1), the quantity would be controlled by float valve (3) which would be positioned by the level of the treated water in the surge tank (6). The water would then flow through heater (D) to valve (2) which would be closed to line (a). All water would then flow through line (b) to treating tank where it would be treated, heated, and deaerated.

The described cycles are very simple in operation. They would provide excellent water at all times for the boiler at a low operating and maintenance cost, and in quantities for continued operation from the standpoint of boiler water conditions. It would also eliminate reduced loads or shutdowns on turbine due to condenser leakage or failure of condenser tubes.

Equally important in conditioning boiler feed water is the elimination or removal of dissolved gases. The higher the operating pressure the more important becomes the necessity for their removal. Deaeration can be accomplished mechanically by incorporating a direct contact heater forming an integral part in the sedimentation tank of a hot process softener. Two types of equipment are available depending upon the pH value of the water to be deaerated and the chemicals used for treatment. When makeup water is used of the average quality, tray cascading is satisfactory. Water softened by ordinary zeolite with an after treatment of acid, or water softened by hydrogen zeolite, is acid and high in CO_2 which causes rapid destruction of trays. To overcome scaling and corrosion of trays, the water is atomized by a high velocity jet of steam. In the operation of this apparatus, the water first is preheated by spraying through a steam atmosphere, after which it is finely subdivided by steam blasts, effectively releasing oxygen and CO_2. Oxygen with this equipment can be reduced from 8.0 cc per liter to 0.01 cc per liter. Free CO_2 from 35 p.p.m. to 0 p.p.m.

A problem confronting most operators of standby boiler equipment is the prevention of corrosion. Boilers can be emptied and dried but they cease to be available for immediate service when this is done.

Experiments in the laboratory and field tests now extending over seven years have proven that corrosion can be arrested in standby equipment.

The control of the hydrogen ion concentration is essential. Before going into detail as to the results that might be expected and the chemicals necessary to accomplish these results, a brief explanation of the theories involved will prove helpful. The mechanism of the corrosion of steel under water has been variously explained, but at the present time most investigators agree on the electro-chemical theory. Wilson of M.I.T. considered the whole question of submerged corrosion under natural water and formulated his theory on the basis of hydrogen-ion concentration. He divided submerged corrosion into three fields—alkaline, natural water and acid; and advanced his explanations on the effects of variables such as pH, temperature, velocity, oxygen concentration and over-voltage on the rate of corrosion.

The initial reaction in the submerged corrosion of steel is electrochemical and operates through a corrosion cell. At the anodic electrode of this cell the corroding metal sends various ions into solution according to the reaction

$$\underset{\text{Metallic Iron}}{Fe} + \underset{\text{2 positive charges}}{2+} = \underset{\text{Ferrous ion}}{Fe^{++}}$$

A corresponding reduction occurs at the cathode area—usually the deposition of hydrogen ions as atomic hydrogen (and subsequent liberation as hydrogen gas), or the reaction of dissolved oxygen to form hydrogen ions. The extent of corrosion is chiefly determined by two factors; namely, (1) the rate of the cathode reduction which in the case of oxygen is limited by the rate of oxygen diffusion, and (2) the formation of protective films.

Protective films or corrosion products serve to prevent contact between metal and corroding agent and the degree of their protectiveness varies with the conditions under which the film is formed. In particular, the pH of the solution against the metal surfaces affects the character of the film because the corroding metal first forms ferrous ions which will then precipitate as ferrous hydroxide. Since the character of the film will vary with the solubility and the rapidity with which the hydroxide is precipitated, it will, therefore, be a function of the pH of the solution at this point.

The process of corrosion results in the formation of ferrous hydroxide against the metal surfaces. The ferrous hydroxide will tend to maintain a saturated solution in the liquid film at the metal surface as long as the pH value of the liquid remains above 9.6.

Iron dissolves in water to form ferrous hydroxide and hydrogen when the pH value of the water is less than 9.6. In pure water the reaction does not proceed to any extent, but when oxygen is present it combines with the hydrogen to form water; and with ferrous hydroxide to form ferric hydroxide or oxide, which is the red substance characterizing iron rust; or to form magnetic oxide or ferrous oxide, which are black and more characteristic of corrosion at higher temperatures. Thus, the oxygen removes both the hydrogen and the ferrous ions from the water, and because of this further dissolution of the metal occurs. The oxygen, therefore, is the quantity factor in the corrosion process, because it is the factor causing a sustained high rate of solvent action of water on the metal.

As long as the pH value of the water is above 9.6 and the oxygen remains dissolved in the water, no particular damaging corrosive action will occur. Against a heating surface, however, the solubility of oxygen in water becomes less. Hence, bubbles may form and attach themselves at random to the surfaces. Whenever a bubble so attaches itself, the whole effect of maintaining alkalinity in the water has been destroyed because that portion of metal underneath the bubble is not in contact with alkaline water. Therefore, at this point a pit starts and grows.

Properly conditioned water will protect boiler metal surfaces from corrosion. In preparing boilers for standby service, and where the water used is not deaerated, it is necessary to operate boilers for a period of approximately 24 hours to remove adhering bubbles from metal surfaces and to make certain the water is in the proper chemical condition. As an added protection to areas where bubbles may adhere, a phosphate film maintained on the metal surfaces has proven valuable.

In preparing boilers for standby service with this method of condi-

tioning, it is essential that there be no possible chance of dilution of boiler water after the boiler has been removed from the line and pronounced in a satisfactory condition from a chemical standpoint. Leaky non-return valves will cause a reduction in the pH value of the boiler water and thus limit its protectiveness against corrosion. Leaky blowdown and water column valves will cause the lowering of the water level (infiltration of oxygen) and thus invite corrosion of uncovered wetted surfaces.

The chemicals used for this protection consist of caustic soda and phosphate, sufficient to produce a pH value in the water of 11 with soluble phosphate equal to 50 p.p.m.

The question may be raised as to why not paint the metal surfaces, eliminating the necessity for accurate chemical control. The answer is, when metal surfaces are to be protected by paint, they must be thoroughly cleaned of all scale and products of corrosion. If this procedure is not followed, then added corrosion will take place under the painted surfaces wherever particles of corrosion are present. The theory of corrosion under paint when the surfaces of the metal to be painted are not entirely void of scale or products of corrosion is as follows:

Corroded metal is porous and will absorb oxygen and moisture from the atmosphere. If the products of corrosion are not entirely removed before applying paint, then the absorbed oxygen and moisture are sealed in with the products of corrosion to form miniature cells which will have the following reactions:

$$\underset{\text{Metallic Iron}}{Fe} + \underset{\text{2 positive charges}}{2+} = \underset{\text{Ferrous ion}}{Fe^{++}}$$

The ferrous ions will react with the water present yielding ferrous hydroxide

$$\underset{\text{Ferrous Ion}}{Fe^{++}} + \underset{\text{Water}}{2H_2O} = \underset{\text{Free Hydrogen}}{H_2} + \underset{\text{Ferrous Hydroxide}}{Fe(OH)_2}$$

which utilizes the oxygen present to become ferric hydroxide.

$$\underset{\text{Ferrous Hydroxide}}{2Fe(OH)_2} + \underset{\text{Oxygen}}{2O_2} + \underset{\text{Hydrogen}}{3H_2} \rightarrow \underset{\text{Ferric Hydroxide}}{2Fe(OH)_3} + \underset{\text{Water}}{2H_2O}$$

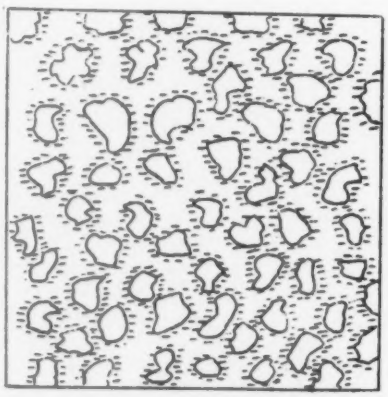
The water from this reaction would then combine with ferrous ions, as above, to produce more ferrous hydroxide which upon oxidation would become ferric hydroxide. In the absence of an excess of oxygen in a solution having a pH value of 9.6 or whenever the oxygen supply should cease, the cycle would be interrupted and equilibrium would be reached with the formation of ferrous hydroxide due to the preponderance of reducing agents over oxidizing agents.

The water formed in the last reaction would combine with ferrous ions as above, yielding ferrous hydroxide and hydrogen ions. There being no more oxygen to react with the ferrous hydroxide, the hydrogen ions would reduce the ferric hydroxide already formed to ferrous hydroxide.

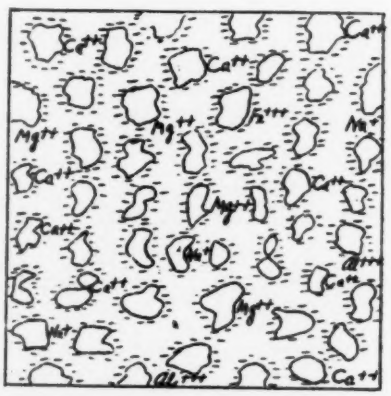
$$\underset{\text{Ferric Hydroxide}}{2\,Fe(OH)_3} + \underset{\text{Hydrogen}}{H_2} = \underset{\text{Ferrous Hydroxide}}{2\,Fe(OH)_2} + \underset{\text{Water}}{2\,H_2O}$$

The ferrous hydroxide formed by this reaction will tend to maintain a saturated solution in the liquid film at the metal surfaces so long as the pH value remains at 9.6, but the intermixing of the water from the above reaction will have a tendency to reduce this pH value. This process can be pictured as a conflict of two opposing forces—the corrosion reaction constantly forming ferrous hydroxide $Fe(OH)_2$ and thus creating alkalinity to maintain a pH value of 9.6, opposed by the process of intermixing which would dilute and neutralize the surface alkalinity. It follows, therefore, that a change in one of these processes which would affect the other would change the ease with which the liquid film could be neutralized. As the pH value of the water is decreased, it finally becomes acid enough to neutralize the surface so that a pH value of 9.6 can be maintained no longer against the metal. The hydroxide will then become more soluble, the protective film will be destroyed, and the liquid at the metal surfaces will be sufficiently acidic to cause hydrogen gas evolution which in turn is corrosive.

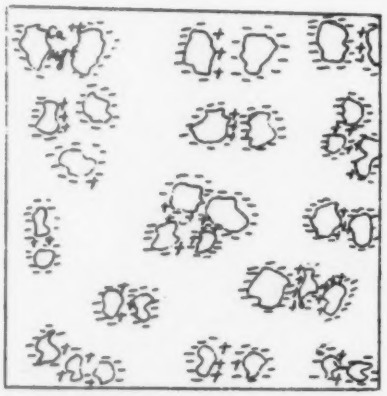
The solution to the corrosion problem of standby boiler equipment or steel under water is to maintain an alkaline condition in the water equal to a pH value of at least 9.6, and prevent the infiltration of oxygen. It is also essential that the oxygen content be lowered below its saturation point at the temperature at which the equipment is to repose. The use of additive chemicals will be necessary if the equipment cannot be made reasonably air tight.



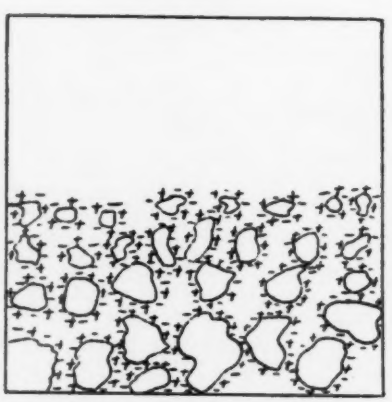
Negatively charged colloid particles in water.



Negatively charged colloid particles with a few positive ions adhering to their surfaces.



Negatively charged colloid particles with enough positive particles adhering to start coagulation



Coagulated colloid particles in which the charges have been completely neutralized.

Discussion on Colloids

Prepared by J. D. Springs

Narragansett Electric Company

Colloids, a term coined by Thomas Graham in 1861 (from colla, glue), as distinguished from what he called *crystalloids* relates to substances whose particle size extends from the range of microscopic visibility, about 200 mμ down to molecular dimensions, about 1 mμ (one millionth of a millimeter). All three states of matter may be involved and various mixtures of them result in colloidal solutions or *suspensions,* some of which form stable or permanent *emulsions* or mixtures, and some separate in a measurable interval thus are unstable or temporary. Familiar examples of colloidal mixtures are blood and milk (solid particles suspended in liquids), gelatine and gum solutions (liquid suspended in solids), whipped cream (gas suspended in liquid), smoke and dust clouds (solids suspended in gas) and mist (liquid suspended in gas).

Colloidal particles, in contrast with average molecules, are large enough to separate the molecules of the solvent beyond the range of their cohesional attractions and therefore possess surface; and phenomena of *surface tension* come into play at the interfaces. The extent of the forces involved becomes more graphic by the realization that when a bit of any substance is subdivided until the particles are of colloidal dimensions, the surface area may be increased a million-fold.

As the particles in a colloidal solution may have thousands of times the volume of those in the molecular solution, of two such solutions containing the same amount of substances by weight, the colloidal solution will contain far fewer particles. Certain physical properties of solutions such as *vapor pressure* and *osmotic pressure* depend not upon the nature, but upon the number of particles of dissolved matter in the solution. Therefore colloidal systems have very little effect in raising the boiling point or lowering the freezing point of solutions and exert only the slightest osmotic pressure.

When a salt is dissolved in water it dissociates into ions. That is, the salt molecule separates into its component parts each bearing an electrical charge. Sodium chloride for example yields sodium ions each bearing one positive charge and chlorine ions each bearing one negative charge. This may be indicated as follows:

$$NaCl \rightarrow Na^{+} + Cl^{-}$$

Sodium carbonate yields sodium ions and carbonate ions:

$$Na_2CO_3 \rightarrow 2\,Na^{+} + CO_3^{--}$$

Now, when a salt reacts in solution with another salt, it does so quantitatively in exact proportion to their molecular weights. Suppose some water contains calcium chloride in solution and we add an excess of sodium carbonate. Of course the calcium chloride is in the form of ions

$$CaCl_2 \rightarrow Ca^{++} + 2\,Cl^{-}$$

and the sodium carbonate ionizes as above. The calcium ions combine with the carbonate ions and a precipitate results because calcium carbonate is so insoluble that it cannot stay in solution to an appreciable extent. A few calcium ions are left in solution plus all the sodium, chlorine and excess carbonate ions. The complete reaction is

$$CaCl_2 + Na_2CO_3 \rightarrow \overbrace{2\,Na^{+} + 2\,Cl}\ 2\ NaCl + \underbrace{CaCO_3}_{\downarrow}$$

This reaction (and others like it) is so precise that exact calculations can be made from it. An entire system of chemical analysis utilizes the accuracy of such a reaction.

Now to return to colloids and specifically those used in boiler feed water treatment. Although they do not form ions in solution they do carry charges, the sign and number depending upon the type of colloid, their particle size and the manner in which they are formed or treated. Those used in treating boiler water are hydrophilic (have a strong affinity for water) and carry negative charges. So long as the negative charges predominate on the particles they repel one another and remain evenly distributed throughout the solution. Also the relatively large particles will attract any positively charged particles within their field until a sufficient number to neutralize all the negative charges have been acquired when coagulation will occur.

This, then, is the theory. Proponents of colloidal treatments claim that the colloids used, although organic, do not decompose under boiler temperatures and pressures and that better boiling conditions obtain by their use because in the process of coagulation much dissolved matter is removed from solution.

Their most serious disadvantage is that no workable method is known for determining the quantity of colloid in solution after treatment. They are more costly than ordinary chemicals and therefore most commercial colloids contain large quantities of the more common chemicals upon which depends the bulk of the treatment. Due to their nature they must be kept and shipped in large quantities of water which increases the handling and transportation charges.

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What Price Mis-Steps by Meter Readers

By
Leslie Childs
Indianapolis, Ind.

THERE IS no gainsaying the importance to a public service company of employing only tactful, alert men as meter readers. This because employees of this class meet patrons upon private premises, and frequently under unfavorable circumstances; and while a meter reader has the right thereon in line of duty, this right is a restricted one, and should be exercised tactfully and with regard for the patron's privacy.

Otherwise, even a slight mis-step by a meter reader, that violates the rights of a patron and results in injury, may quite easily render his employer liable in damages. In truth. a meter reader, unless tactful and alert, may prove a source of risk to his company. And, as examples of judicial reasoning in situations of this kind, the following cases will serve.

Meter Reader Enters Without Warning

In one case, a meter reader in the employ of the defendant, a public service company, entered a private home for the purpose of reading the meter. This was located in the kitchen and, it was alleged, that the meter reader burst into the room without giving any warning of his presence.

The plaintiff, wife of the home owner, and two small children were in the room and, at the unexpected appearance of the meter reader, who was a stranger to the plaintiff, the latter fainted, fell over a sewing machine, and as a result suffered a nervous breakdown. Plaintiff thereafter sued the defendant for damages and the circuit court gave plaintiff judgment for $500. The defendant appealed, and the higher court in affirming the judgment reasoned, in part, as follows:

The Language of the Court

"We do not wish to be understood as holding that defendant did not have the right to send its agents to these premises, and that it did not have a right to free access at reasonable times for the purpose of reading the meter; but the mere fact that it may have free access under the terms of this contract [contract with the home owner] certainly did not mean that its agent had a right to enter * * * without knocking or making any announcement of his presence or business.

"He could have knocked * * * and announced who he was, and for what purpose he was upon the premises, and not have pushed open the kitchen door and rushed in, and then, after the damage had been done announced his presence and business. This contract did not authorize the invasion of the sanctity of this home in the manner and under the circumstances in which access was gained in the present case. * * * The judgment * * * is accordingly affirmed." (227 S.W. 264)

So much for the foregoing case. Let us examine another of this class that arose under the following facts. Here the plaintiff and her sister were eating lunch in the kitchen when a meter reader in the employ of defendant, a public service company, knocked and announced his presence. He was not the regular meter reader and, in answer to his inquiry as to how to get to the basement, plaintiff directed him to a pantry door.

When the pantry door was opened, a trap door was disclosed that led to the basement. The meter reader observed this, and raising same went down the stairs into the basement. At this time, so plaintiff claimed, she told the meter reader to close the trap door when he came up to go outside. Plaintiff and her sister resumed the eating of their lunch, and a few minutes later the meter reader came from the basement and left.

A few minutes thereafter, plaintiff opened the pantry door and supposing the trap door to have been closed by the meter reader, stepped inside. The trap door had not been closed, and plaintiff fell down the stairs to the basement, suffering severe injuries. Plaintiff sued the defendant for damages, and was awarded a judgment for $3,000, though the meter reader testified that he did close the trap door. On appeal the higher court in affirming the judgment, among other things, said

What the Court Decided

"In the case at bar plaintiff testified that she told the meter reader to put the trap door down. There is nothing in the testimony indicating that he made any response to this request but plaintiff testified that she relied upon him putting it down. * * *

"It is insisted that there is no evidence that the meter reader left the trap door open. The facts in this connection, show that there was no one in the house except plaintiff, her sister and the meter reader and that neither plaintiff nor her sister left the trap door open. It is admitted that the meter reader was the last one to leave the basement and, although he testified at the trial that he put the trap door down, and this was the only direct testimony on the point, the jury was not required to believe his testimony but could have inferred, * * * that he left it open. * * * The judgment is affirmed." (127 S.W. 2d 1055)

Conclusion

The foregoing cases constitute apt illustrations of the importance of the exercise of tact and care on the part of meter readers in their contacts with patrons. The law reports carry a number of these cases; that there are not more of them reflects highly upon the general efficiency of this class of public service employees, when their numbers and the difficulties they encounter daily are considered.

Of course, since each case of this kind has necessarily been decided upon its particular facts and circumstances, the subject cannot be covered by any hard and fast rule. However, this much may be said. It takes mighty little, in the form of negligence on the part of a meter reader, to make a jury case against his employer, where a patron shows injury to him resulted. And, as examples of the possible price of mis-steps here, the cases reviewed are of force and value.

From standing stop to flashing speed *...in seconds*

THE SECRET? CONTROL

The super streamlined train owes much of its efficiency to a modern system of *control* which enables it to glide from a dead stop to flashing speed—within seconds. It has helped carry rail transportation to new heights of popular following.

The gas industry, too, has witnessed the far-reaching effect of modern *control*. The Harper Burner System has brought to today's gas range an accuracy and ease of control unmatched by any other cooking unit. Whenever the Harper Burner System is demonstrated, gas, the cooking fuel, takes on new interest, new desirability with the public.

CONTROL *is the secret here, too*

● The Harper Burner System is a patented invention whereby each of the burners on the range is actually 2 burners in 1 . . . a burner within a burner . . . both operated and controlled by a single handle.

This arrangement affords a high-speed STARTING BURNER to *start* foods boiling and for fast frying . . . plus a small, central, economical COOKING BURNER for *maintaining* the cooking. The COOKING BURNER can be used entirely independently of the STARTING BURNER. No other top burner possesses this vital advantage — which insures easy, accurate control: just the right heat for every type of top-burner cooking . . . every time.

HARPER-WYMAN COMPANY
8562 Vincennes Avenue, Chicago, Ill.

HARPER BURNER SYSTEM

HARPER BURNER SYSTEM

Demonstrates GAS at its best

SEE OTHER SIDE OF THIS PAGE

"Absent Cooking"
made possible by the Harper Burner System

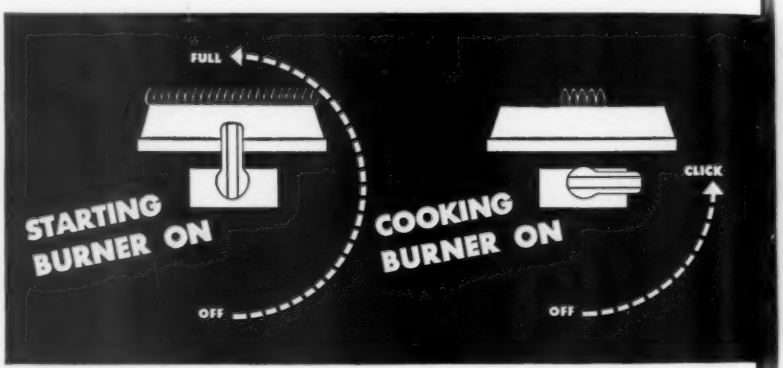
. . . the average woman is freed from more than 8½ hours of unnecessary pot watching per week

● "Absent cooking" is a term that came into use when women learned that the Harper Burner System made practical a *new method* of top burner cooking. No longer was it necessary to pay close attention to foods to keep them from boiling dry and scorching.

After food has been started on the STARTING BURNER, the economical, dependable COOKING BURNER takes over the remainder of the cooking. This COOKING BURNER is accurately proportioned to *keep* the contents of a covered vessel at the boiling point of 212 degrees. A larger flame would only waste gas, because it could not speed the cooking. Also, a larger flame would boil away the water too fast . . . *would require closer supervision.*

The COOKING BURNER requires more than an hour to boil away a cup of water in a covered vessel. Because it is dependable, the housewife need only see that there is *one* cup of water in whatever food is being cooked for *each hour* she expects to be away from the kitchen. No danger of the flame blowing out from an unexpected gust of wind, either...it would automatically re-light.

By portraying "gas at its best" with advantages such as the example given here, the Harper Burner System is daily winning new converts to gas as a cooking fuel . . . *holding* present users who are thinking of changing to another fuel. No other top burner can do this so well, because of the superior *basic difference* in construction.



The Harper Burner System provides a burner within a burner. The diagram above shows how the COOKING BURNER operates entirely independently of the STARTING BURNER. Yet both are controlled by the same handle.

We shall be glad to send you, without cost, two booklets that tell the complete Harper Burner System story . . . "Modern Methods of Top Burner Cooking" and "The Greatest Cooking Discovery in 40 Years". They should be valuable to anyone interested in the promotion of gas cooking and gas appliances. *Harper-Wyman Company, 8562 Vincennes Ave., Chicago.*

HARPER
BURNER SYSTEM

SEE OTHER SIDE OF THIS PAGE

"Oomphasizing" Your Merchandise

By
H. Vinton Potter
Merchandise Sales Manager
Oklahoma Natural Gas Company

ALL Abo-o-o-a-a-a-r-d — hasty good-bye's were said as men and women scrambled aboard the over-long train—the whistles gave a reassuring toot—and 150 salesmen were on the way to the New York World's Fair—winners in a four month contest sponsored by the state Servel refrigerator distributor. While our part in this particular contest had been small, each man who boarded the train was given a generous amount of "folding money" by our company to add to his enjoyment while in the "big city." I merely mention this as one of the successful ways of rewarding salesmen for effort expended, and more about this particular campaign and its results later on.

H. Vinton Potter

I should like to set forth some of the reasons for conducting merchandising campaigns—and enumerate a few of the ways in which we have found that zest can be added to make them click. It is not enough to emphasize your load-building appliances—enough drama should be spent on selling them so that your salesmen *and* your prospective customers will know that something special is happening. In this article, we shall consider, however, only the steps to be taken to "oomphasize" our campaigns with the men who are pushing the doorbells.

Filling the Sales Valleys

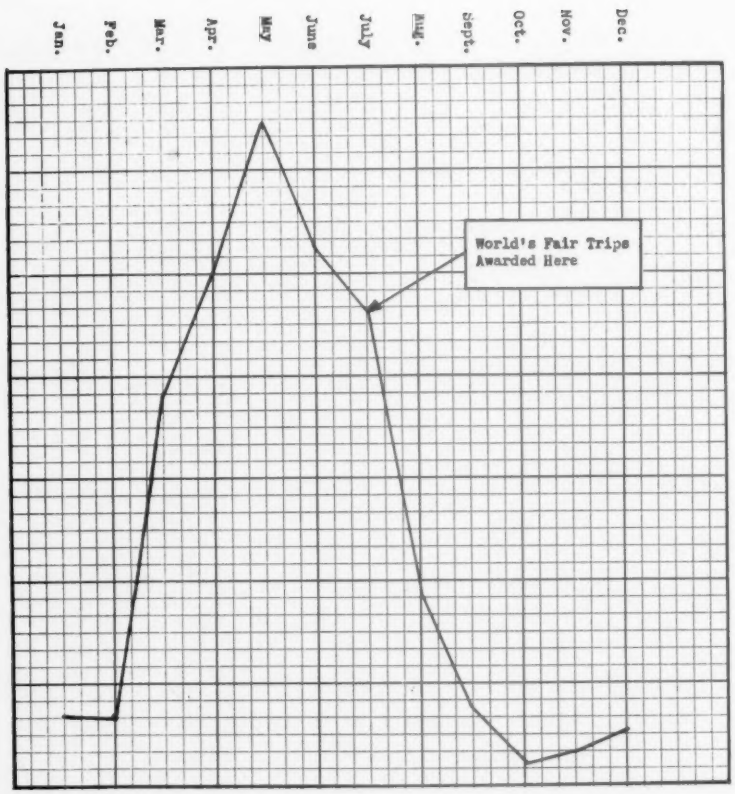
Before dealing with specific ways of rewarding effort, let's see just what motives lie behind most of the campaigns we stage. First and foremost is the desire to improve sales. It seems as though we should ever be alert to the challenge of filling in the valleys that are obvious on nearly every selling chart. Right now, the efforts of your National Refrigeration Committee are being directed toward this very thing; and we in the utility field have much to do if we are to fill in some of the seasonal slumps which are noticeable in this appliance alone. There are those, however, who claim that it is far more effective to capitalize on peak selling seasons—making these peaks even bigger—than to spend an equal amount of effort trying to build sales against the seasonal trend. In our own case, where we must do our merchandising entirely through dealer organizations, this latter course is more productive of immediate results; *but* for long-term results, education of dealer and consumer should be carried on to level seasonal surges.

The second reason for campaigns is Education. Whether it be for your own sales force or that of your dealer, there are certain times during the year when attention should be given to each important load-building item if for no other reason than for the training it gives the men and women involved. Here again, I must mention our own problem here in Oklahoma where dealers do the merchandising. We have found that each dealer is anxious to take advantage of seasonal buying trends. Some are aggressive in their manner of going after the business, some wait for it to come to them. In any event, all can benefit by preparation. For that reason, we plan co-operative campaigns in which they join hands, and these campaigns are so planned that they precede the *normal buying* season by at least 2 weeks. The value of this 2 week period is inestimable in its educational value alone. The store owner gets his stock in order; the salesman gets his prospect list up-to-date; he gets his selling story out of mothballs, dusts it off, *and* when the *real* buying wave starts, his percentage of sales is higher *because* he is better prepared. Then there are some cases where campaigns should be scheduled during off seasons to keep the salesmen thinking in terms of the entire line-up of appliances—a sort of check valve against the tendency that sometimes occurs among men who are supposed to sell all lines to drift off into the field of specialization.

Campaign Themes

Now as to the contests themselves, and here I shall confine myself entirely to methods we have used here in Oklahoma. Every salesman likes to have fun along with the serious business of earning a living. Pounding the pavements all day, ringing doorbells trying to find prospects, or even doing floor duty becomes far more interesting if in addition to the commissions normally paid, there is a bit of fun, a little rivalry, a generous portion of make-believe in a contest which, though often childish, brings in sales and makes men better natured at home, in the store, and in your customer's home. So, we always select a theme for each campaign; run off a special supply of stationery to use during the campaign, and then, during the entire activity, put as much fun into it as our imagination will allow. In this article, I cannot deal with the mechanics of these campaigns; but the appliance, the season, the theme, the compensation—all are closely related and require more than casual attention.

Now as to compensation. Is there a need for anything *extra* to make men work hard? We have a perfect right to assume that men—whether they be our own salesmen or those of dealers—are adequately paid and should exert their best efforts without having extra bait dangled before their eyes to make them do their job better. Well, salesmen are just like all of us—just human. You know how proud you are of the button you wear that denotes membership in some civic club—and admit it or not, you know how you like to see your name in print for some achievement. Well, salesmen are just like you and react the same way. So perhaps the best yardstick you can use in setting up prizes, bonuses, spiffs, rewards, or whatever you may call them, is to think what you would like if you were the salesman.



REFRIGERATION SALES - OKLAHOMA NATURAL GAS COMPANY TERRITORY

Awards

There are all types of awards. First, just plain recognition and it's surprising how many folks are content with just that. A poll was taken of some factory employees to see what they wanted from the management. Was it shorter hours? More pay?—no—just recognition for what they did. Recognition may take the form of a trophy from the president of your company, a letter of congratulation from the sales manager, a plaque to hang on the wall, or a lapel button for the salesman to wear. And by the way, just notice who among your friends are wearing lapel buttons—insurance achievement pins, auto sales leaders, service pins—they love 'em.

Salesmen will always work harder for something they could not ordinarily expect to enjoy from their own income. In this category is the ever popular trip. An airplane ride to a distant city with a dinner, a show, and return trip—a train ride with a few days to play in some city that is known for its frivolousness—a trip to a convention—a cruise to a foreign land—all are excellent and make men do their best. Whenever possible, include the wife in such a deal. This should be done for 2 reasons. First, because it's only fair that the good, patient wife who sits home while her husband is out closing sales should be in on the fun because she has deserved it by her indulgence; and second, because by including the wife, the salesman will work harder and his wife will see to it that he wins so she can go along. One way of working up a contest of this sort is to set a minimum quota for which you can afford to award a trip. Then for extra accomplishments, extras will be awarded. For instance—for making his quota exactly, the salesman gets a trip by train—second class. For an extra 10 per cent he travels first class. Another 10 per cent, and he gets all his meals free—another 10 per cent and he gets $10.00 spending money, etc.—the variations are endless—and the fun you can have with daily bulletins, office charts, etc., is easy to contemplate. Usually a contest with a trip as its goal can last over a longer period of time than the usual sales campaign—and will, in most cases, have the desired effect of distributing sales more evenly over a period of several months. In the case of the World's Fair Contest mentioned in the opening paragraph of this story, the results can best be seen by the accompanying graph. Naturally, sales will fall while the men are away and it will take a while for the men to get back in stride as is graphically shown on the chart—*but* —good planning will minimize the ill effects and capitalize on the potential good. In this particular case where the sales were all made through dealers, another good result was evident—men stayed longer at the job and did not move about as is customarily the case. Dealer salesmen are unstable—moving from one job to another—wherever pastures seem greenest—and a long period contest sometimes makes them think twice before moving if they have something at stake.

Cash prizes are always good—after all, every man has some bills hanging over his head which ready cash will help pay off. One of the first things to remember in setting up cash prizes is that everyone shall have an equal opportunity to win them. Of course, there are some men who could never qualify no matter how simple the rules—but, within reason, every man should be able to at the start to say to himself that he has a chance. If he can't say that —your contest has 2 strikes on it before it starts. These prizes don't have to be too big—like some of the young fortunes that are being given away in radio contests—nor should they be so small they aren't worth the effort. Then, too, rather than put it all in one prize, spread it a little so several men can get in on it—there will be more enthusiasm and more fellows will put their best into it. Then if one salesman gets the jump on all the rest of the men and has the prize won almost before the contest starts—at least there are other prizes left to keep the men going.

Prizes

Merchandise prizes offer one of the most interesting ways of rewarding selling effort. All salespersons have wants they know c a n n o t be gratified within the bounds of a limited income—a new fishing rod—a portable radio—a new set of golf clubs—an automatic rifle—luxuries, yes—things they could not buy without crippling the family budget, but —if they win them as prizes—oh boy!

In our situation, merchandise prizes have been most successful. Each fall, we run a combination house heating and water heating campaign involving about 750 salespeople and accounting for a normal 3500 units of merchandise. With this large number of units, it is practically impossible to put more than

$1.00 per unit into the campaign, which in the case of an item selling for even $75.00, seems a bit small. Now here is where you can stretch your prize dollars—make each dollar buy two dollars in merchandise.

Your purchasing department has valuable contacts with firms selling luggage, radios, silverware, cutlery, hardware, sporting goods, camping equipment, clothing, household necessities—these can all be purchased at attractive discounts for prize awards at prices that will make the money you have to spend do double duty.

Don't decide how many prizes you can give—but how much you can spend per unit sold. Then if your campaign is the success it should be, and exceeds your estimate, you can afford to put more into prizes. In any event, you determine ahead of time your selling expense per item. Another tip—include in your prize list items for the whole family. It's surprising how many men will order things for their wives or sweethearts. We have many salesmen who get all their Christmas presents through our fall contest—and better gifts by far than they could ordinarily afford. It's surprising, too, how it helps if you mail the prize lists to the salesman's home so his wife can look it over and decide for him what he's going to win—and then she'll see that he does, too. Don't give shoddy merchandise—only the best—well-known brands—because good prizes are the best representative your company has among the men you depend on to sell load-building appliances.

Bonuses

Cash bonuses—no matter how small—are always welcome if everyone can earn them on every sale made. When the Certified Performance Range Program was introduced in the fall of 1938, we offered a $2.50 bonus for each one sold during November, December, and January. We didn't sell many CP Ranges because the manufacturers weren't ready to deliver many at that time; but it did our heart good to see the way the salesmen tried to get them. The $2.50 wasn't big—if they were getting 10 percent on their sales—a CP Range was paying about $13.95 commission, anyway. But that $13.95 is the "bread and butter" money and the bonus added, the "jelly." Yessir, cash bonuses are always welcomed by salesmen everywhere.

In this story—too brief for the broad field it is supposed to cover—I have tried to tell some of the devices we have found successful in increasing sales. There are others, of course—but these are the ones we have worked successfully here. Some are better than others, but to say which is best is impossible because situations, needs, conditions, and personalities differ; and every campaign, with its attendant rewards, must be tailor-made to get the best results.

Sprague Meter Co. Provides New Warehouse on the Pacific Coast

F. L. Fairchild, President of the Sprague Meter Company has announced that the Corporation had purchased a tract of land in the Hostetter Industrial District of Los Angeles, California, where they will start work immediately on a modern warehouse to serve the Gas Industry in that territory in the most efficient manner. In constructing this warehouse, the management has an eye to the future possibilities of manufacturing on the Coast should it be found economically sound to do so and of material advantage to the customers.

E. H. Roseberry, Vice President of the Company, will be in full charge of this new program.

Their many friends and customers will look upon this venture as a forward step in serving the Pacific Coast.

TITAN WATER HEATER CONTROLS

AGA Approved
TITAN Temperature and Pressure Relief Valve

This device is installed on the hot water outlet in the tank directly in the flow of water. Action, as a result, is unfailing and positive, there being no dead pockets to prevent proper functioning of relief valve.

Pressure relief is obtained through a spring-loaded valve which opens when the pressure reaches a predetermined point. Should the water become overheated to 200° F, a fusible disc melts and lets the water escape thereby preventing a further increase in temperature.

The Titan Relief Valve serves as a coupling connected in the line thereby eliminating the necessity and expense of a tee fitting. To replace fusible disc, it is not necessary to disassemble valves or piping in any way.

Design for application to storage or range boilers. Prevents corrosion, scalding and explosion.

Catalog and full information upon request.

The Titan Valve & Manufacturing Company

Thermostats • Safety Pilots • Relief Valves • Safetystats
9913 Elk Avenue Cleveland, Ohio

ONE CLICK becomes 160,000,000!!

Six years ago one utility offered its customers a new idea in water heating —

The Republic LO-BILL Conversion

The new idea CLICKED.

Now this utility enjoys the pleasant music of 160,000,000 clicks each year as 8000 meters click off the added load in cubic feet.

These clicks average 1800 cubic feet for every meter on the lines.

AUTOGAS CORPORATION

2240 DIVERSEY AVENUE CHICAGO, ILLINOIS

A NEW HIGH in CAPACITY

● **A new High in CAPACITY—a higher rating than any comparative single or double valve Regulator in the Low Pressure field. Yes, the new Reynolds Low Pressure Regulator has all the engineers admiring its remarkable performance. It has fifty percent greater capacity than the same size, old type regulators.**

All of this without loss of the Reynolds Accuracy, the Unequalled Sensitiveness, and Rugged, Long Lived Service. Write for details as to how this new Regulator will solve your Low Pressure Gas Control problems. Let our Engineering Department assist you.

BRANCH OFFICES
422 Dwight Building
Kansas City, Mo.
2nd Unit,
Santa Fe Building
Dallas, Texas

REPRESENTATIVES
Eastern Appliance Company
Boston, Mass.
Wm. A. Ehlers
268 Park Street
Upper Montclair, N. J.

REYNOLDS GAS REGULATOR CO.

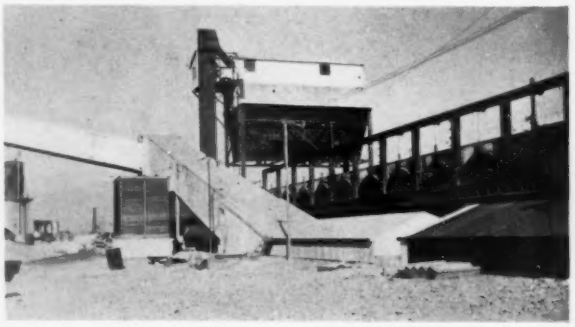
Anderson, Indiana, U. S. A.

GAS CONTROL SINCE 1892

CURRAN-KNOWLES GAS AND COKE OVENS

Successfully carbonize Low Volatile, High Volatile, Swelling or Non-Swelling Coals.

Give a high yield of superior quality coke for water gas generator fuel, industrial and domestic use; a high yield of tar of excellent quality and a uniform quality of gas which meets Commission requirements.



The Midwest Radiant Corp. Plant near Millstadt, Ill.

Substantial construction. Low initial cost per M. capacity. Low operating cost due to simplicity of design.
Ask for bulletins showing plants and products.

COAL CARBONIZING CO.

Bank of Commerce Bldg. St. Louis, Mo.

All sizes up to 3,400 cu. ft. capacity

Meters
Diaphragms
Repairs
Provers
Pumps
Calorimeters
Wet Meters
Gauges
Apparatus

METER REPAIR PARTS

FOR

ALL MAKES — ALL SIZES OF METERS

LARGEST GAS COMPANIES NOW USING OUR PARTS

SEND FOR OUR CIRCULAR ON METER REPAIR PARTS

SAMPLES AND PRICES GLADLY SENT

— 0 —

LAMBERT METER CO.

PLAINFIELD, NEW JERSEY

The Housing Census Includes Questions on Domestic Gas Consumption

By

A. W. von Struve

Washington, D. C.

FOR THE FIRST TIME in America's three hundred years of growth, an exhaustive survey of its housing facilities is to be undertaken during April, 1940, as part of the Sixteenth Decennial Census activities of the United States Bureau of the Census. There have been various local surveys of housing in the past; most of them have been in the urban field. These have themselves been incomplete, and in only a few cases were they comparable from the point of view of time or similarity of questions asked.

The 120,000 enumerators employed by the Census Bureau will collect information on all of the estimated 33,000,000 occupied and 2,000,000 vacant dwelling units in the country.

Considerable emphasis has been put by Bureau experts upon the obtaining of equipment and conveniences data about the American home. There are several questions which concern the gas industry directly. The resulting information will be of direct benefit to those interested in plans for expansion, marketing new areas, and promoting the greater use of gas. One question concerns the nature of the lighting equipment in the house—gas, electric, kerosene or gasoline, and other. Another question, to be asked only for occupied dwelling units, covers heating equipment, with such items as central steam or hot water, piped warm air, pipeless warm air, or heating stove. The tabulations of this question will result in invaluable information for gas equipment people, since it will indicate the markets for new equipment or for replacement of older types of furnaces.

Of most immediate interest, however, are the two questions on fuels. For heating, information is to be requested on whether the fuel used is gas, coal or coke, wood, fuel oil, kerosene or gasoline, or other. Invaluable comparisons of the uses of these various fuels in different parts of the country will result from the answers to this question, and especially the differences in consumption for heating between natural and manufactured gas areas.

A similar question on cooking fuels covers electricity, gas, coal or coke, wood, kerosene or gasoline, or other, and here for the first time certain aspects of a highly competitive field will be unveiled in detail. A question on refrigeration equipment does not go further than differentiating between mechanical and ice, but the data on number of ice boxes still in use in various areas of the country will have its value in the industry's merchandising plans.

Results of the Housing Census are to be published for states, counties, cities, and minor civil divisions, and will in all probability be co-ordinated with certain major information classifications from the general population schedule, such as annual income from wages and salaries, and occupation of head of household. Economic facts such as these will for the first time in America's history present the industry with a complete analysis of income levels and, consequently, of consumption markets.

The schedule for the Housing Census was prepared with the collaboration of a large number of interested trade associations, financial groups and research organizations interested in housing.

In advocating a Census of Housing, experts in this and related fields point out that the information gathered will be of inestimable value in the determination of future housing policies. It will be of especial interest to manufacturers, builders, distributors and bankers in their study of trends in home ownerships and building in the United States. Census authorities explain that through their tabulations it will be possible to determine facts of vital importance to local geographical and political subdivisions. For example, cities will be able to determine the distribution of the various types of housing within their limits, together with the possible need of expansion of transportation and communication systems, police and fire protection, schools, and similar facilities.

The tables will also help social workers to establish relationships between certain types of housing and human needs by correlating their own data on characteristics and locations of clients with the census information on characteristics of the homes.

Home finance institutions will find the average amount of mortgage and the data on mortgages of value in proving and checking the soundness of their investments and the possibility of mortgage expansion.

The Housing Census will be made at the same time as the balance of the Decennial Census and will be made by the same workers. Authority for the housing census was voted by Congress at its last session. Action on the appropriation has been deferred until the 1940 session.

The questions to be asked by the enumerators in connection with the housing phase of the census have been tentatively set up as follows:

1. **Characteristics of structure in which dwelling unit is located:**
   - Type of structure: One-family detached, one family attached, two-family side-by-side, other two-family, three-or-more family structures and structures with business by number of dwelling units.
   - Structure originally built as: Residential structure with same number of dwelling units, with different number of dwelling units; non-residential structure.
   - Exterior material: Wood, brick, stucco, other.
   - Is this structure in need of major repairs?
   - Year structure was originally built?
   - Located on a farm?

2. **Characteristics of dwelling unit:**
   - Number of rooms.
   - Water supply: In dwelling unit—running water, handpump; within 50 feet of dwelling unit—running water, other.
   - Toilet facilities: In structure—flush toilet for exclusive use, shared flush toilet, other; out side toilet or privy.
   - Bath tub or shower with running water in structure: For exclusive use; shared with other households.

Lighting equipment: Electric, gas, kerosene or gasoline, other.
Estimated rental value of owner-occupied or vacant non-farm dwelling.
Occupancy status of vacant dwelling: For sale or rent—ordinary dwelling, seasonal dwelling; held for absent household—ordinary dwelling, seasonal dwelling.

3. Characteristics of occupied dwelling unit:

Home tenure: Owned, rented.
Color or race of head of household.
Total number of persons in household.
Refrigeration equipment: Mechanical, ice, other.
Is there a radio in this dwelling?
Heating equipment: Central steam or hot water, piped warm air, pipeless warm air, heating stove.
Fuel for heating: Gas, coal or coke, wood, fuel oil, kerosene or gasoline, other.
Fuel for cooking: Electricity, gas, coal or coke, wood, kerosene or gasoline, other.
Monthly rental or renter-occupied dwelling.
Rental value without furniture of renter-occupied non-farm dwelling with use of furniture included in rent.
Cost of utilities and fuel paid for by non-farm renter in addition to monthly rental.
Value of owner-occupied home.
If owner-occupied non-farm, is property mortgaged?

4. Mortgage characteristics of owner-occupied nonfarm 1 to 4 family structure:

Present amount of outstanding indebtedness on first mortgage or land contract; on junior liens.
Frequency and amount of regular payments on first mortgage or land contract.
Do these regular payments include principal reduction?
Real estate taxes?
Interest rate on first mortgage or land contract?
Type of holder of first mortgage or land contract: Building and loan association, commercial bank, savings bank, life insurance company, mortgage company, HOLC, individual, other.

Feldbush Elected V.P. Worthington Pump & Machy. Corp.

The election of H. A. Feldbush as a Vice-President of the Worthington Pump and Machinery Corporation is announced by H. C. Beaver, President. Effective immediately Feldbush will make his headquarters at Holyoke, Massachusetts, where he will have charge of operations of the corporation's Holyoke Works in the manufacture of air and refrigerating equipment. He was formerly general manager of the Carbondale Division of Worthington at its Harrison, New Jersey, works, and in his new capacity will continue as an active member of the Carbondale Operating Committee.

Swink Joins Hoyt Heater Co.

William F. Swink has resigned from the Cleveland Testing Laboratories of the A. G. A. to become associated with the Hoyt Heater Company, Los Angeles, California. He brings to his new duties a thorough training in water heater testing as well as experience in their development and manufacture.

Joining the Laboratories' staff in February, 1937, Mr. Swink was employed in the water heater section. Later he entered the employ of the Pittsburgh Water Heater Company, Pittsburgh, Pa. Returning to the Laboratories in May, 1939, he has since been engaged in the testing of water heaters and central heating equipment.

AMERICAN MADE
LAVINO ACTIVATED OXIDE • SLURRY • SPONGE
Made in the United States, specifically for maximum H_2S removal. Available for prompt shipment. Sold with purification cost guarantee. Disinfected to minimize formation of mold or other fungus growth.
LAVINO
"ACTIVATED"
OXIDES
E. J. LAVINO and COMPANY • 1528 Walnut Street, Philadelphia, Pa.

CHAMPION

The "PREFERRED" *Gas and by-Product* COAL

FOR RICHER YIELD— FOR BETTER COKE!

You'll *get* the results you require, when you use Champion Coal . . . a high yield of rich gas—a dense, firm coke of maximum salable size. Coke made from Champion is proved—by screen, shatter, and tumbler test—to be unexcelled for domestic, water gas, blast furnace and foundry use. • Just try Champion—you'll agree *"it's the best!"*

CHAMPION COAL

PITTSBURGH COAL COMPANY

General Offices: Oliver Building, PITTSBURGH, PA.

Cleveland, Ohio Sault Ste. Marie, Mich. Buffalo, N. Y. Utica, N. Y. New York City Philadelphia, Pa. Youngstown, Ohio

PITTSBURGH COAL CO., LTD., London, Ont.; Hamilton, Ont.; Toronto, Ont.; Windsor, Ont.

PITTSBURGH COAL CO. of Wisconsin, Duluth, Superior, Minneapolis, St. Paul

MILWAUKEE-WESTERN FUEL COMPANY, Milwaukee, Wisconsin

BARBER BURNERS

for All Gas-Burning Appliances

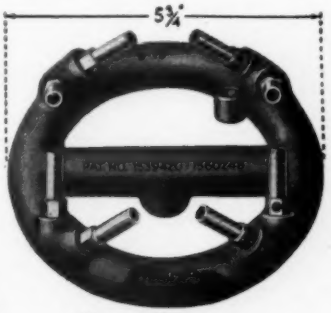
A gas appliance, no matter how good, is *no better than its burner.* Barber has developed its impinged jet principle to the highest flame temperature so far attained on atmospheric pressure—1900°. For efficiency and economy, there is simply no comparison between this highly effective combustion method and the primitive "Venturia Tube" principle common to virtually all other burners. The burner is the heart of the appliance and the ultimate answer to sales and service problems. Follow the advice of experts—see that *your* appliances are Barber-equipped.

•

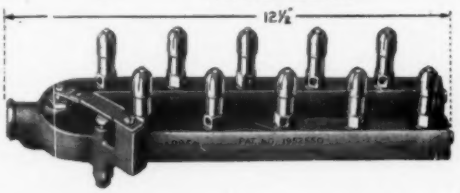
We are Gas Burner Specialists and offer you without obligation the services of our engineering and laboratory facilities for the solution of your burner problems.

•

Write for Catalog and Price List on Barber Burners, Pressure Regulators, and Controls.

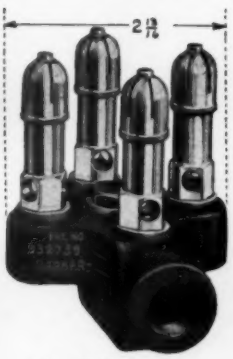


No. S-15 Burner



No. C. U.-90 Burner with Safety Pilot

No. B-60 Burner



No. C-40 Burner

THE BARBER GAS BURNER CO.

3704 Superior Ave., Cleveland, Ohio

Address Michigan inquiries to

The Barber Gas Burner Company of Michigan
4475 Cass Ave., Detroit, Michigan

BARBER *Automatic* JET GAS BURNERS

• for Warm Air Furnaces • Steam and Hot Water Boilers

and Numerous Other Heating Appliances

The Modern Deep Fat Fryer and Its Efficient Maintenance*

By
Alfred T. Pitman

J. C. Pitman & Sons, Inc.
Lynn, Mass.

THE NEW technique in deep fat frying calls for a fryer of immersion-tube type, whereby heat is applied through tubes located above the bottom of the cooking vessel. This results in having the hot fat above the tubes and cold fat below the tubes. During the frying process, all sediment and particles drop below into the cold zone.

Nature's law of gravity thus provides a means of removing from the source of heat those essentials of frying, such as flour, meal and water, that ordinarily are the cause of burned, broken-down fat.

The appliance should also be designed so that the heat radiated from these tubes is not any greater than the smoke point of the fat. For instance, if the heat at the point of contact with the tubes is, say 550° F, and the smoke point of the fat is only 425° F, then it is only natural that the fat in contact with the heating medium is going to burn before the rest of the fat reaches the desired temperature. I have learned from long experience that the design of the tube is of great importance to the successful operation of the appliance. The tubes must be designed for the maximum transfer of heat into the fat; and it is my experience that an open end tube allows the heat to pass through too rapidly, thereby not giving the transfer into the oil as it should. My company has built fryers using baffle tubes to obtain the best results.

Careful consideration should be given to the cost of the fuel that is being used; and, of course, this varies in different localities. For many years, my company manufactured both gas and electric fryers—oil and coal not being suitable generally for this type of appliance — but three years ago, after conducting an extensive survey of utility rates in the large cities of the United States, we came to the conclusion that gas was the cheaper and most popular fuel for deep fat frying. As we are also interested in operating at a profit, we naturally turned toward the most lucrative field and now manufacture gas-fired frying equipment almost exclusively.

The maintenance of the highest standard in serving cooked foods calls for absolute predetermined temperatures from the refrigerator to the customer. For the purpose of this discussion, we shall omit the low temperature so essential in food preservation, and dwell on the higher frying temperatures so essential to the appearance, texture, palatability and digestibility of fried foods.

A deep fat fryer should be equipped with an approved temperature controller or thermostat graduated from 200° F to 400° F, and so designed that the indicator cannot be turned higher than 410° F.

To obtain the highest standard finished product in fried food, the food must be fried at its particular, individual temperature and in a stated definite time.

The frying temperature from the start to the finish of each batch should not vary more than a few degrees. In other words, the practice of baking and roasting in either falling or rising temperatures commonly practiced with oven products does not apply to fried foods. The fried food will absorb more or less fat at the lower temperatures and the fat will burn up at the higher temperatures. For this reason a fryer with a foolproof thermostat is necessary, and the heat input should be great enough to prevent any appreciable lowering of temperature when chilled foods are first placed in the hot fat.

The following table of time and temperatures is the result of practical commercial applications observed over a period of twenty years.

The length of time required depends wholly on the amount of food fried at one time. When small orders are fried, a lower temperature and less time may be required than is shown in the table. On the other hand, overloading the fryer is not recommended as this results in lowering the temperature too much, causing the food to become soggy, and also takes a longer time.

Just as freshness of raw materials is the secret of the ultimate in fried foods, so is cleanliness the secret in connection with the highest standards of equipment maintenance and the life of frying fat. Various methods have been used in cleaning deep fat fryers. My observation has shown me that most of these methods are entirely wrong. I am going to leave out all the chemical phrases that I possibly can, because I realize that I am

Table of Time and Temperatures

	Temperature	Time
Saratoga Chips	325°F	5-8 Minutes
French Fried, Blanching	365-370°F	5-12 "
French Fried, Browning	395-400°F	2 "
Shoestring or Julienne	325-335°F	3-10 "
Latticed Potatoes	350-375°F	3-10 "
Souffle Potatoes, Blanching	225-240°F	5-8 "
Souffle Potatoes, Puffing	425°F	1 "
Perch and Smelts	370°F	3-5 "
Fillets	370°F	4-6 "
Fish Cakes, Croquettes, etc.	390°F	1 "
Oysters	390°F	1 "
Chicken, in batter	375°F	5-8 "
Cutlets and Breaded Chops	360-400°F	5-8 "
Doughnuts	385-390°F	3-5 "
Fritters	370-380°F	2-5 "
Frankfurters	270°F	1 "
Chinese Noodles	380°F	1 "
Almonds	240°F	4-6 "
Cashews	275°F	3-5 "
Blanching Peanuts	300°F	3-5 "
Spanish Peanuts	350°F	3-5 "
Clams	380°F	1½ "

**Part of a paper presented at Southeastern Regional Restaurant Convention and Exposition, Washington, D. C., December 6, 1939.*

talking to restaurant people and not to chemists. One of the greatest causes of foaming in a deep fat fryer is because the wrong method of cleaning has been used. For instance, a great many people use a cleaning solution with a lye base. The usual procedure has been to drain off the fat, fill the fryer full of water and dump in a cup or so of strong cleaning solution. I have found that ordinary soap powder and strong caustic solutions have more commonly been used. The fryer has then been allowed to boil for awhile and then drained off, after which the fryer is possibly rinsed and then it is the usual thing to dump in the fat.

After this cleaning process, the fryer was apparently clean; but the truth of the matter is that a film of strong caustic, or oleic acid was left on the side of the kettle. Now, when this new fat is put in the kettle and heated, it immediately starts to saponify with this film, thereby causing the manufacture of soap. At the end of a day's frying, after this method of cleaning has been used, if you were to take an analysis of the fat, you would find that the fat contained a large amount of oleic acid, or sodium oleate. These acids are produced from the film that was left on the side of the kettle. This is one of the chief reasons for "short life" fat. This is one of the chief reasons why fat does not last as long as it should even in a modern deep fat fryer.

To prevent this, a deep fat fryer should be cleaned as follows:

1. **The fat should be drained off, strained, or put to one side and allowed to settle.**
2. **Fill the pot with water, heat to boiling and add from three ounces to one pound of good cleaning compound, such as that manufactured by the "Wyandotte," "Oakite," "Calgonite," and "Soilax" companies.—I am not in the cleaning compound business, but I do know that the cleansers mentioned are of either a tri-sodium phosphate, or meta-phosphate base. Undoubtedly, there may be other good cleaning solutions on the market that I am not familiar with.**
3. **After boiling for about twenty-five minutes, shut the burner off and allow to stand over-night, if possible.**
4. **Drain and re-fill with water. Boil and drain.**
5. **Re-fill with water, heat, and add from two tablespoons to a cup of white vinegar, depending on the size of the fryer. Stir and allow to stand a few minutes before draining. Re-fill with water and drain.**
6. **Add the new fat, or the fat which was put to one side—first re-straining it.**

Vinegar is composed largely of acetic acid which will neutralize any alkalinity left from the cleaning compound. If by chance a small amount of vinegar, or acetic acid, should be left in the pot when the fat is added, no harm will result, the reason being that acetic acid is volatile—evaporates at a low temperature—and when the fat is heated up the acetic acid will evaporate away. If anyone of you care to go into this matter in a more technical way, a very quick and efficient test is to use blue litmus papers which turn red in the presence of acids and remain blue in the presence of alkalies.

This may seem to be a rather lengthly procedure of cleaning; but, Ladies and Gentlemen, it will really pay you dividends. My experience has taught me that people who have adhered directly to these directions are getting two to three days longer use of the frying fat, than those using haphazard methods.

The next and last important matter that should be considered in profitable deep fat frying is the type of fat that is used. After extensive research, we have come to the conclusion that an all-hydrogenated vegetable shortening should be used. There are several high-quality, all-hydrogenated fats available on the market.

One of the reasons an all-hydrogenated shortening is superior to other fats and oil for deep fat frying purposes is that hydrogenated fat is more staple and resists oxidation and hydrolysis better. Oxidation is the combining of the fat with the oxygen in the air; and it is this process which causes such things as rancidity and gumming. Hydrolysis is the combining of fat with water; and it is this process which causes the development of free fatty acid in the fat. Hydrogenated fats resist oxidation and hydrolysis better because their chemical structure has been changed during the hydrogenation process, and the weak elements in the fat have been removed. All high-quality hydrogenated vegetable shortenings contain less than 5/100 of 1% free fatty acid. The fatty acid content of animal fats is considerably higher. With this high fatty acid content, animal fats have "two strikes" against them before you start to fry.

The ability of a fat to resist during the frying process the development of free fatty acid which contributes to the smoke and darkening of the fat is a very important quality of the frying medium. All-hydrogentated shortenings are generally better in this respect.

Another important detail is to avoid scorching of the fat. Great care

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BECAUSE . . . It offers at no additional cost a control that is positive and accurate.

FRIALATOR cooks food thoroughly and rapidly. The taste of one food is never transferred to another. Black specks are never seen on foods cooked by the FRIALATOR METHOD.

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FRIALATOR eliminates the fire hazard from your bake shop. Protects employees and property.

The fat is never too hot nor too cold. Thermostat keeps the grease at just the right temperature. It never burns. FRIALATOR construction prevents grease from "boiling over."

FRIALATOR improves the quality, appearance and taste of your fried foods.

FRIALATOR increases efficiency, speeds service, adds convenience, saves time and labor.

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should be taken, when the fryer is loaded, in melting new fat and cold fat. This should be carefully done so that the fat is brought to the proper temperature without being burned, or scorched. Fat absorbs and conducts heat slowly. For that reason, the fat nearest the heating medium may easily become o v e r - h e a t e d, or scorched, before the main body of fat is melted. In melting a fat, the heat should be turned on to a low degree, taking just a little more time. This extra time will pay dividends in increased frying life of the fat. Not under any circumstances should the heat be turned on before the fat is placed in the kettle.

A small amount of scorch, or broken down fat accelerates the breakdown, or decomposition, of all the fat in the kettle.

The Amount of Fat to Use

The best way to determine the proper amount of fat to use in any given installation is to think of the turn-over of the fat. In the process of frying, fat is absorbed by the fried products and is thereby removed from the kettle. Fresh fat is added to replace the absorbed fat; thus, there is a turn-over of the fat. Turn-over can be defined as the relation between the amount of fat added over a period of a day and the capacity of the fryer.

For example: As compared to the total amount of the fat present in the kettle, if the turn-over is rapid, the amount of fat which must be drawn away will be minimized. As a general rule, it is considered best that at least 20% of the fat should be replaced with fresh fat everyday. Whenever it is possible to increase the turn-over, the frying operation will be improved. If the turn-over is too low, it may eventually become necessary to discard some of the fat. In some installations under normal operating conditions, it is never necessary to throw away any of the fat used for frying. The following figures will illustrate the point about turn-over:

Case No. 1—Capacity—100 pounds
Fat added per day—10 pounds
Turnover—10%

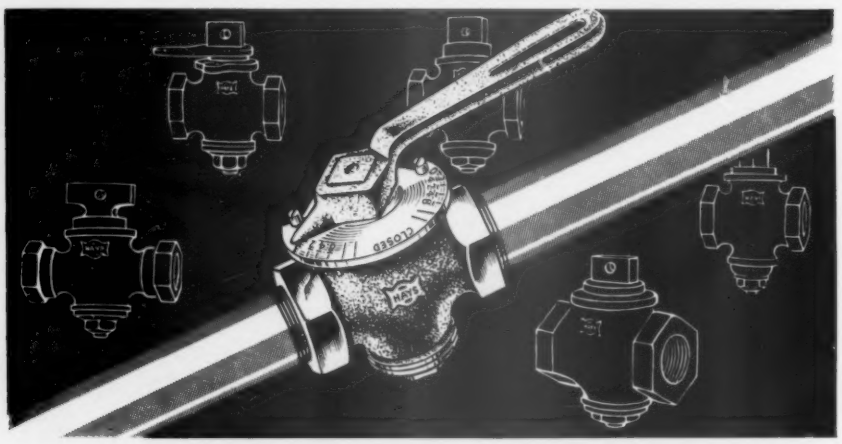
Case No. 2—Capacity—50 pounds
Fat added per day—10 pounds
Turnover—20%

In case No. 1, we have a kettle of 100 lbs. capacity and the amount of fat added each day is ten pounds. The turn-over in the case would be 10%.

Now let us assume that we can do the same job with a smaller kettle, using only 50 lbs. of fat. There would still be a replacement of 10 pounds of fat per day, or in the second case the turn-over would be 20%. The fryer in case No. 1 is using an excess of fry fat to no advantage. In effect, an extra 50 pounds of fat is being burned up just as surely as if it were in separate kettles. There are two methods of correcting a condition of this kind:

1. **The amount of fat used can be cut down to the very minimum on which the kettle will operate, or**
2. **If the reduction of fat by this means is not sufficient, then a smaller kettle should be used.**

For example: If we could not fry in the large kettle in Case No. 1 with only fifty pounds of fat in the kettle, it would be too big for the amount of food being fried, and a smaller kettle should be used. In every installation, the smallest practical quantity of fat which will fry the amount of food required should be used. The only precaution is to use enough fat so that the temperature will remain reasonably constant. With the least amount of fat, you can see that the turn-over brought about by the absorption is rapid; and, under these conditions, we have the minimum amount of fat being held at the frying temperature.



HIGH PRESSURE *Gas* STOPS

Hays Brass Stops for gas, steam or liquids are widely used integral with manufactured products and on gas service lines. Over 70 years of specialized experience in making brass fittings make Hays a reliable source of supply. Consult Hays, for hundreds of patterns, types and sizes of stops are available in complete size ranges.

HAYS MFG. COMPANY **Erie, Pa.**

HAYS BRASS FITTINGS for WATER and GAS
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Colorful Gas Range Catalog

The new Cribben & Sexton 1940 Catalog describing and illustrating in colors all the details of "Universal" gas ranges is a fine example of the printer's art.

Its 96 pages with plastic binding for flat opening depict in a most colorful way each individual model including the CP group. Dimensional diagrams are given and the features of construction shown in detail. Full color illustrations of appetizing dishes are included. The various features of "cooking luxury" are stressed.

Small ranges for kitchens of limited space and combination gas range with coal-wood heater and incinerator are also shown. An index of contents and a comparative equipment chart enables quick reference to each model and feature. The sales manual section, highly colorful, takes the first 34 pages and the final 62 pages constitute the catalog section.

Address of the Company is 700 N. Sacramento Boulevard, Chicago.

Rubber Hose: The Mechanical Goods Division, United States Rubber Co., Rockefeller Center, New York, has recently issued a 34-page booklet entitled, "U. S. Hose Hints." The booklet is designed to enable customers to get more service out of the various types of hose used, and to help select the correct hose for specific purposes. In addition it contains information in the form of tables, etc.; illustrates the various kinds of hose construction; lists various hose terms; methods of making hose; and includes a number of useful tables.

Pacific Coast Gas Assn. Spring Sales Conference

A special feature of the Spring Sales Conference of the Pacific Coast Gas Assn., held at Los Angeles, Calif., Feb. 12, 13 & 14 was a contest amongst the salesmen of appliances. Prizes of $10 each was awarded for ideas placed on the conference program, and $25 prizes for the best paper in each of the diviisons—domestic, commercial and industrial and home service. Over 300 papers were submitted and the prize winning papers numbered over 25 covering the three divisions. The papers covered all phases of selling and contained valuable suggestions.

Several other papers were presented at the Conference, all on subjects of special interest to sales managers and salesmen.

During the Conference, ceremonies commemorating the opening of the Pacific Coast Branch of the A. G. A. Testing Laboratory were held. Alexander Forward, Managing Director of American Gas Association in his address outlined the laboratories history from the first testing of flexible gas tubing in Cleveland, O., on August 1st, 1925.

An addition to the program was the presentation of a very marvelous marine clock and barometer to Mr. A. F. Bridge and a wrist watch to Mr. G. E. Steller for their work in planning and building the new Los Angeles Laboratory. The presentations were made by Major Forward.

The final grand prizes were awarded by the Executive Committee to the following:

Commercial and Industrial Sales Classification: $25 to Don Johnston of the Portland Gas and Coke Company, Portland, for the suggestion entitled, "Sales Make News — News Makes Sales."

Home Service Classification: $25 to Marguerite Fenner, Pacific Gas and Electric Company, Sacramento, for the suggestion entitled, "Increasing the Effectiveness and Reducing the Cost of Home Service Work."

Domestic Sales Classification: $25 to R. D. MacMahon, Southern California Gas Company, Glendale, for the suggestion entitled, "A Study in Electric Replacements."

P.C.G.A. Committees for 1940

Pacific Coast Gas Association has announced their committees for 1940 as follows:

General Accounting:—C. T. Burns, Chairman, Southern California Gas Company.

Commercial and Industrial Sales:—Otto Ketelsen, Chairman, San Diego Consolidated Gas and Electric Company.

Mr. Ketelsen has organized the following Sub-committees:

Commercial Cooking and Baking:—J. L. Hall, Chairman, Southern California Gas Company.

Commercial Heating and Water Heating:—L. W. Tannehill, Chairman, Southern California Gas Company.

Utilization Data Bulletins:—Ray Trowbridge, Chairman, Seattle Gas Company.

Production Committee:—M. L. Fort, Chairman, Los Angeles.

Manufactured Gas:—G. R. Horning, Chairman, Seattle Gas Company.

Natural Gas:—R. M. Bauer, Chairman, Southern California Gas Company.

Distribution Committee:—C. P. de Jonge, Chairman, San Diego.

Meters and Regulators:—W. L. Kindred, Chairman, Southern Counties Gas Company.

Customers' Service Costs:—Lee Holtz, Chairman, Southern California Gas Company.

Transmission Committee:—Grove Lawrence, Chairman, Taft.

Compressor Stations:—J. H. N. Ellis, Chairman, Industrial Fuel Supply Company.

Utilization Committee:—J. C. Mueller, Chairman.

Air Conditioning—Art Hess, Chairman, English & Lauer, Inc.

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Preferred Equipment for GAS DISTRIBUTION Work

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100 Pounds or More Cut to Medium or Low Pressure

PRESSURES of 50 to 100 pounds or more in tanks or transmission lines are reduced to medium or low pressure for distribution by the Fulton Toggled Reducing Regulator. Can be equipped for accurate control of natural gas, manufactured gas, or by-product gas. For reversing furnaces, constructed with oversize valves. Ask for Circular 2573, also Catalog of C-F Regulators for all requirements of pressure control.

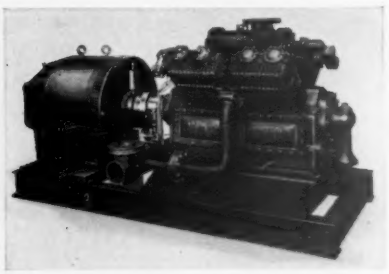
The **CHAPLIN-FULTON MFG. CO.**

28-40 PENN AVE. CF PITTSBURGH, PA.

New Equipment

V-Type Refrigeration Compressor Unit

Refrigeration Units, designed primarily for air conditioning applications, and utilizing a new eight-cylinder V-type compressor for Freon-12, are offered by Worthington Pump and Machinery Corporation, Carbondale Division, Harrison, N. J. Capacities range from 75 to 125 tons for single units and up to 250 tons with duplex arrangement.



Worthington Compressor Unit

Although of sturdy construction, they are light in weight and compact, providing large capacity where floor space or head room is limited. These units are built with either V-belt or direct motor drive and can be supplied with either a horizontal shell and tube type condenser mounted on the unit or without the condenser for use with a Worthington-Carbondale Shower Condenser.

This new refrigeration unit is ideally suited to the air conditioning requirements of medium-large department stores, theatres, office buildings and assembly halls.

A complete description, with drawings and data, is contained in Worthington Bulletin C-1100-B7.

High Pressure Lubricated Plug Cock for Gauge Lines

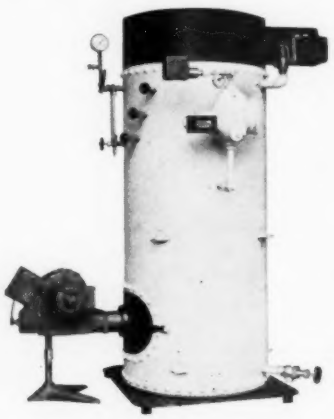
To provide a leakproof gauge cock which can be completely opened or closed with ¼ turn, engineers of Merco Nordstrom Valve Co. have developed a lubricated type for test pressures up to 4000 lbs. This gauge cock has a rated working pressure for water, oil and gas of 2000 lbs. Its body is forged steel and it has a stainless steel plug. Stick lubricant is inserted under a lubricant screw which can be turned down. Turning of the screw transmits hydraulic pressure to the seat, and in the event the cock becomes hard to turn, the pressure exerted will loosen it.

Leak-Proof Gauge Cock

Special lubricants are available for steam. This gauge cock is made in ¼" and ⅜" sizes and is wrench-operated. Details may be obtained from Merco Nordstrom Valve Co., 400 Lexington Avenue, Pittsburgh, Penn.

New Type Process Steam Boiler

The P. M. Lattner Mfg. Company, Cedar Rapids, Iowa, have issued a descriptive bulletin showing an industrial type or process steam type boiler equipped with a combination burner. This burner may almost be described as an oil burner which will burn either regular grades of fuel oil or natural gas.



Lattner Gas-Oil Boiler

It is not at present suitable for use with gas of less than 900 BTU content and permit full boiler capacity.

Installation may be made with both an oil line and gas line available at the boiler. The change from one fuel to the other can then be made in an hour or two. Parts for converting the burner for use with both fuels are furnished. Equal efficiency is obtained with either fuel.

The primary purpose in design is for the benefit of users where gas is cheap in summer and high in winter. Many users of industrial gas boilers are receiving a favor-

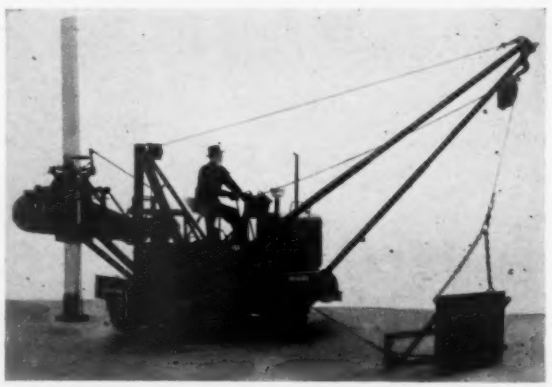
Cleveland Model "80"

One of the special features of this machine is that when backfilling it can work from either side of the ditch and the dirt can be either pulled in or pushed in, by the scraper. A light dirt scraper permits backfilling, where dirt has been placed on sidewalks or lawns, without damage. When necessary or desired, a heavier scraper can be quickly attached. Tests with the Clevelond Model "80" have proven that it meets completely every requirement for a most efficient small backfiller, saving materially on the time normally taken for this type of work.

The Model "80" is equipped with a built-in tamping device which drops a weight of 175 pounds 45 times per minute, with a resultant impact of 380 foot-pounds.

For pipe-placing—the boom and cable-winches of the Model "80" have been purposely made strong enough to permit the handling and laying of pipe, pulling of sheathing and other light crane-operations.

For complete information regarding this new machine address The Cleveland Trencher Company, 20100 St. Clair Avenue, Cleveland, Ohio.



Cleveland Model "80"

and Appliances

able industrial rate but are on contract to get off the line during the heating season on twenty-four hours notice.

To companies who want to build up their off peak gas load, this new combination gas fired and oil fired boiler-burner unit will have special appeal. Designed for the cleaner and dyer, laundry, dairy, creamery, etc.

EMCO Pilot Loading System of Pressure Regulation

Recent developments in distribution, measurement and combustion service demand close control of operating pressures. In anticipation of these requirements, the Pittsburgh Equitable Meter Company has announced that EMCO Pilot Loading Control Systems have been perfected to provide operating characteristics unattainable in former conventional regulator designs.

EMCO Pilot Loading Control

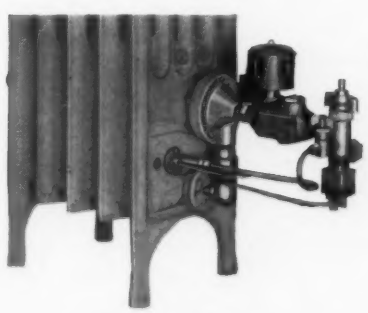
This manufacturer claims it is no longer necessary to tolerate pressure fluctuations which in the past have been accepted as unavoidable in all regulators. With the new EMCO controls, it is stated that regulation accuracies within one per cent are commercially available without resorting to delicate instruments or unproven control systems. The ultimate in accuracy is said to be now obtainable with EMCO controls which are simple in design, rugged in construction, self-contained, compact, neat appearing and economical in operation. These advantages represent such outstanding improvements that many weight loaded type diaphragm cases are being replaced with the new type of controls.

In order to secure the highest degree of control accuracy for outlet pressures of 2 to 300 pounds, the EMCO Pilot Loading System has been developed and may be applied to any EMCO High Pressure Balanced Valve Regulator originally built for lever and weight loading as well as to new regulators. For outlet pressures above 300 pounds, the standard lever and weight loading is generally satisfactory because two stage reduction should be employed for these higher pressures, and the second stage regulator can be arranged with pilot loading for close control of the final pressure.

The advantages of this system of pressure regulation are fully described in Bulletin 1055, which will be sent to those interested by writing to Pittsburgh Equitable Meter Company, 400 Lexington Avenue, Pittsburgh, Pa.

Automatic Control and Safety Pilot

The Automatic Gas Equipment Company, 497 Brushton Ave., Pittsburgh, Pa., announces a new automatic control and safety pilot for their gas-steam radiators which is available with or without room thermostat. Either natural or artificial gas may be used as fuel.



Automatic Safety Pilot

Constructed of cast iron, these gas-steam radiators are available in both vented and unvented types and operate automatically without boiler, water pipes, coal, ashes or janitor service.

The new device uses a constant burning pilot and a positive safety pilot. Its design is such that it is impossible to obtain a flow of gas to the burner in the absence of a pilot flame. The operation is extremely simple; manually actuate the valve with the reset button and ignite the pilot flame. Within a few seconds the valve will remain open. The valve will snap closed in the event of failure of the pilot flame, giving 100% shut-off.

Approved by American Gas Association and listed as standard by the Underwriters' Laboratories.

Penn Solenoid Gas Valves Cover Many Applications

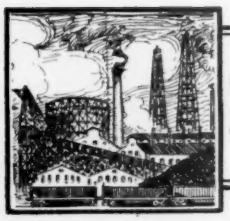
In their recently announced line of Solenoid Gas Valves, Penn Electric Switch Co. offers to the gas heating industry a wide choice of sizes and capacities from ¼" I.P.T. connector to 1" I.P.T. connector.

These valves offer a wide choice of capacities from 25 cu. ft. per hour to 435 cu. ft. per hour based on gas of .6 specific gravity at ½" water pressure drop. They are regularly supplied as standard automatic valves, but may be had at no extra cost with semi-automatic manual operating button when so specified.

These valves are available with line voltage coils for all commercial voltages and frequencies, and for D. C. service, and also are available with 24 volt coils for space heating applications where the close temperature control of Temtrol, Penn's heat anticipating thermostat, is desired.

Valves are provided with a brass valve seat and with a special oil treated "meter" sheepskin disc. This construction assures a permanently tight seal unaffected by metal particles or the hammering of repeated operations over a long period of time. The valves close in the direction of the gas flow further insuring a tight seal. The extremely quiet operation of these valves is of particular interest to the man who sells and installs domestic heating systems where noise transmission through conduit and gas connections might be a problem.

An engineering bulletin fully describing these valves and containing roughing-in dimension drawings and other detailed application information may be had by writing to Penn Electric Switch Co., Goshen, Indiana.



News of the Gas Industry

Something for Everyone—At A. G. A. Industrial Gas Sales Conference, Toledo, March 28-29

Ralph S. Wenner, The Ohio Fuel Gas Co., Toledo, Ohio, and his Committee on Program and Papers for the 1940 American Gas Association Conference on Industrial Gas Sales have worked to plan the industrial gas man's "event of the year," slated for the Commodore Perry Hotel, Toledo, Ohio, March 28-29.

According to Franklin T. Rainey, The Ohio Fuel Gas Co., Columbus, Ohio, and Chairman of the Industrial Gas Section, "The program for this year's Industrial Sales Conference shows an excellent balance of interests. Irrespective of the particular part you play in maintaining and developing your company's non-residential gas load, this conference promises more than one feature which will be right up your alley. We are anticipating a record-breaking attendance."

Toledo has been picked as the scene of action because it is centrally easy to reach from a maximum number of industrial centers, because its industry is well diversified, and because it is a real live-wire center for industrial gas. Thursday and Friday, March 28 and 29, have been selected as the dates so that industrial gas men will not have to break up a week's work to attend.

Eleven Shirt-Sleeve Features

Advance information describes the following features of the program:

William E. Whalen, The Electric Auto-Lite Company, will speak for the plant engineer—will put industrial gas men under the microscope and tell them what their customers think of them. He ought to know. He supervises all manner of industrial heating operations in both large and small plants situated in seven different cities.

Kendall B. Castle, Jr., Rochester Gas and Electric Corp., will treat the summer air conditioning phase of non-residential gas sales activity. As a man who knows both the equipment and the market for it, he will discuss what types of gas air conditioning are best suited for various types of jobs, and what practical procedures to follow in closing orders for this type of business.

A. F. Koch, The Surface Combustion Corporation, will speak for the manufacturers who make cataloged industrial gas equipment.

No single man could do justice to the competitive problem up for analysis this year—to wit, near-infra-red ray heating. Hence a clinic has been scheduled, at which Hale A. Clark, Michigan Consolidated Gas Co., Frederic O. Hess, The Selas Co., and others, will give authoritative considered opinions. One of these will be based upon extensive engineering research on the subject.

The viewpoints of management will be aired by E. M. Tharp, Vice President and General Manager, The Ohio Fuel Gas Co., at the Thursday luncheon. And C. George Segeler, American Gas Association will discuss the possibilities of gas as a chemical (as well as a fuel) in the ingenious hands of twentieth-century industrialists.

The new General Sales Committee of the Industrial Gas Section, organized last December, already has developed suggestions for general industry contemplation. H. Carl Wolf, Atlanta Gas Light Company, and chairman of the group, will dish them up as related to local sales planning procedures. Lloyd E. Thomas, Michigan Consolidated Gas Co., will tell how industrial gas window displays in the Detroit company's main office building have built business as well as customer and employee good will. The new techniques recently developed in open-flame heating—for annealing, hardening, cutting, singeing, etc., will be evaluated by A. M. Thurston, The East Ohio Gas Co., Cleveland.

Round-Table Sessions

Parallel round-table discussions will give everyone a chance to find out what his colleagues throughout the country are doing to get business in such fields as: metal treating and melting, process and comfort air conditioning, volume water heating, etc. Committee Chairmen Clayton S. Cronkright, Public Service Electric & Gas Co., Newark, N. J., Charles R. Bellamy, Columbia Gas & Electric Corp., New York, and Lawrence E. Biemiller, Consolidated Gas Elec. Light & Power Co. of Baltimore, will guide the discussions.

Ralph L. Towne, Toledo, and six "Information Please!" experts he has assembled from top gas utilities in various parts of the country will take all comers and give the Conference the benefit of some mighty high-grade industrial gas experience.

Annual Business Conference New England Gas Association

The Fourteenth Annual Business Conference of The New England Gas Association will be held March 14 and 15, at Hotel Statler, Boston.

Opening March 14th at 10 A.M., the program includes: Company sales contest awards, Election of officers and directors, Address of A. G. A. Managing Director, Division best paper awards, Report of N. E. G. A. Executive Secretary, Community development program by H. C. Thuerk, Address of A. G. A. E. M. Treasurer, Address of N. E. G. A. President, Address of A. G. A. President.

At 2 P.M.: "Petroleum Industry and Gas Industry," by Fred Van Covern; "Looking Ahead through Cost Accounting," by William F. R. Munnich; Pan discussion by group of 7; one-act play by Brooklyn Union Cast.

On the 15th at 10 A.M.: "Domestic Shrinkage," by D. H. Linton, followed by an appliance sales symposium to include the following:

(a) The case for ranges by J. J. Quinn
(b) The case for water heaters by George F. Wells
(c) The case for refrigerators by Arnot D. Hirst
(d) The case for commercial and industrial by C. George Segeler
(e) The case for kitchen heating by B. J. Bean
(f) The case for house heating by R. D Stuart, Jr.
(g) The case for air conditioning by C. F. Cushing
(h) Summary of implications by C. G. Young

A Servicing project symposium will include:

(a) Accounting Servicing Committee by H. L. Dalbeck
(b) Contact and Job Training Committee by J. L. Johnson
(c) Equipment Design and Standardization Committee by E. H. Eacker
(d) Gas Conditioning Committee by E. R. Hamilton

"The Consumer Movement" will be discussed by James L. Fri; the Trade Association Movement by Herbert Gutterson; Gas Company Progress by Hall M. Henry, and Telephone Research and Planning by T. Cooper, Jr.

At the Home Service Luncheon there will be comments by John A. Weiser, "Modernizing Home Economics Equipment," by J. F. Tullie; "Home Service at Framingham," by Eleanor G. Kingsley and "Home Service Meets the Consumer," by Eliza M. Stephenson.

An appliance and equipment exhibit will also be a feature of the meeting.

CONVENTION CALENDAR

March

11-12 *Wisconsin Utilities Assn.*, Convention of Gas Section, Technical and Commercial Divisions, Pfister Hotel, Milwaukee.

14-15 *New England Gas Association*, Annual Convention, Hotel Statler, Boston.

18-19 *Oklahoma Utilities Assn.*, Annual Convention, Biltmore Hotel, Oklahoma City.

28-29 *American Gas Assn.*, Industrial Sales Conference, Toledo, Ohio, Commodore Perry Hotel.

April

5 *Maryland Utilities Assn.*, Lord Baltimore Hotel, Baltimore, Md.

11-12 *Pacific Coast Gas Assn.*, Spring Technical Conference, Embassy Auditorium, Los Angeles.

15-17 *Midwest Gas Association*, Annual Convention, Lincoln, Neb.

16-18 *Southwestern Gas Measurement Short Course.* College of Engineering, University of Oklahoma, Norman, Okla.

17-19 *Missouri Association of Public Utilities.* Annual Convention, Elms Hotel, Excelsior Springs, Mo.

21-23 *Gas Meters Assn. of Florida and South Georgia*, Hollywood Beach Hotel, Hollywood, Fla.

May

6-10 *Amer. Gas Assn.* Natural Gas Section's Annual Convention, Rice Hotel, Houston, Texas.

6-10 *Amer. Gas Assn.* Annual Distrib. Conference, Rice Hotel, Houston, Texas.

13-14 *Indiana Gas Assn.*, Evansville, Ind.

14-16 *Penna. Gas Assn.* 32nd Annual Convention, Skytop, Pa.

18-25 *International Petroleum Exposition and Congress*, Tulsa, Okla.

20-22 *A.G.A.E.M.* Annual convention, French Lick Springs, Ind.

30-31 *Natural Gas and Petrolcum Assn. of Canada*, Hotel London, London, Ont.

July

3-5 *Canadian Gas Association.* Annual Convention, aJsper Park Lodge, Alberta, Canada. Northwest Conference of Pacific Gas Association will hold joint sessions.

8-10 *Michigan Gas Assn.*, Grand Hotel, Mackinac Island, Michigan.

September

18-20 *Pacific Coast Gas Assn.* Annual Convention, Hotel del Coronado, Coronado, Calif.

26-27 *Empire State Gas & Electric Assn.*, Annual Convention, Westchester Country Club, Rye, N. Y.

October

7-11 *American Gas Assn.*, Twenty-second annual convention, Atlantic City, N. J.

Mid-Winter Sales Conference Pennsylvania Gas Assn.

The Mid-Winter Sales Conference of the Pennsylvania Gas Assn. was held at the Bejamin Franklin Hotel, Philadelphia, Pa. The meeting was in charge of Frank Trembly, Chairman.

George E. Whitwell, vice president Phila. Elec. Co. urged the need of rigid inspection prior to installation of water heaters to insure proper location and necessary changes in piping. Mr. Whitwell discussed the experience of his company in the development of promotion, sales and installation of water heaters over a period of five years.

R. J. Canniff, Sales Promotion Manager, Servel, Inc., Evansville, Ind., stressed the importance of gas refrigeration in the sales plans of the gas industry.

R. E. Agee, A. G. A. E. M., manager C. P. gas range program, illustrated his talk with a number of charts showing the economy of the C. P. range, and particularly the proper cooking of all foods due to accurate heat control.

After luncheon, the meeting was addressed by George W. Allison of Edison Electric Institute, New York, who urged that appliances be sold on the basis of what they would do rather than what they cost.

Harold Coleman, Brooklyn Union Gas Co., Brooklyn, N. Y., talked on the subject "Changing Employee 'Suspects' into Sales," and Roy H. Warmee, Phila. Coke Co. on the subject "Short Cuts to Successful Street Selling."

Indiana Gas Association

The Officers and Directors of the Indiana Gas Association have decided to hold their 30th annual convention at Evansville, Indiana, on Monday and Tuesday, May 13 and 14. The Southern Indiana Gas and Electric Company is the host for this year. The Program Committee personnel are as follows: F. B. Cully of the host company, H. G. Horstmann of Indianapolis, C. V. Sorenson of Hammond, G. R. Woehler of Evansville.

A comprehensive program is being arranged for this convention.

Maryland Utilities Assn.

The Spring Meeting of the Maryland Utilities Association will be held at the Lord Baltimore Hotel, Baltimore on Friday, April 5th. The morning will be devoted to separate meetings of the Gas, Electric and Transportation Groups with addresses by specialists in each group. A combined session will be held in the afternoon featuring discussions of the personnel and public relations aspects of the utility business.

Robertshaw Research Laboratory

Because of the increasing importance of its technical research work, the Robertshaw Thermostat Company has equipped the modern building at 120 Washington Boulevard, Pittsburgh, as a laboratory devoted exclusively to research in the field of electric and gas temperature controls.

Here all the research work which was formerly done independently by three divisions — the Robertshaw Thermostat Company, Youngwood, Pa.; the American Thermometer Company, St. Louis; and Grayson Heat Control, Ltd., Lynwood, Calif.—has been centralized and coordinated under the direction of S. G. Eskin.

It is expected that each of the three divisions will greatly benefit from the use of the combined facilities of the laboratory, which are being further increased through the installation of entirely new testing devices.

The establishment of the Robertshaw Research Laboratory is stated by officers of the Robertshaw Thermostat Company to be one of the initial steps in a comprehensive program of product development, involving continuous investigation of new materials, new applications, and new markets.

The Robertshaw program contemplates progress in many distinct directions, not only as regards technical innovations and improvements but as regards the conditions under which thermostatically controlled equipment are manufactured, sold and resold. It is confidently expected that from the Robertshaw Research Laboratory will come the means of making such equipment more profitable to appliance maker, distributor and ultimate user alike.

The new Robertshaw Research Laboratory at 120 Washington Boulevard, Pittsburgh, devoted exclusively to research in the field of electric and gas temperature controls.

Gas Exhibit Feature at Show

More than 25,000 builders, architects and engineers gathered at Lakeside Hall, Cleveland, Ohio, on January 22-26, to attend the Sixth International Heating and Ventilating Exposition.

Among the 333 exhibits sponsored by nationally known manufacturers of heating equipment, controls and accessories was the booth sponsored by the Commercial Section of the American Gas Association in cooperation with the East Ohio Gas Company. The booth encompassed 1,025 square feet and had as its basic theme the sale of gas heat in the residential field during the past year.

Nineteen manufacturers of gas heating and water heating equipment and control devices joined with the American Gas Association and the East Ohio Gas Company in presenting this display which was very well attended and attracted considerable comment and attention from those attending the show at which hundreds of thousands of dollars worth of equipment was on exhibition.

The exhibitors in the booth included L. J. Mueller Furnace Co., Bastian-Morley Co., Inc., White-Rodgers Electric Company, Detroit Lubricator Company, Westinghouse Electric and Manufacturing Co., General Controls Company, Reznor Manufacturing Co., Forest City Foundries, Surface Combustion Corp., Waterman-Waterbury Company, Ira E. Baker Company, Hotstream Heater Company, Cleveland Heater Company, Gas Equipment Company, Lennox Furnace Co., Bryant Heater Company, Burnham Boiler Co., American Radiator-Standard Sanitary Equipment Corp., Servel, Incorporated.

Oregon State Air Conditioning Conference

A discussion of district steam heating, a session at which leading architects will present subjects of their own choice, and an open session for the general public, will be innovations at the third annual Oregon State Air Conditioning Conference at Corvallis, March 28-30, 1940.

Sponsored by the College, the conference is held on the campus in the school of engineering. Earl C. Willey, assistant professor of mechanical engineering, is general chairman. The conference enjoys the support of manufacturers of heating, air conditioning and allied equipment, as well as members of the trade in general.

"Condensation in Building Construction," by Dr. J. E. Lodwick of the U. S. Forest Service, will be a highlight of the conference, as will be "Zoning Your Heating System," by John Mueller of the Payne Furnace & Supply Company of Los Angeles, Calif.

Michigan Gas Assn.

The annual convention of the Michigan Gas Association is to be held at the Grand Hotel, Mackinac Island, Mich., from July 8 to 10 inclusive. An unusually interesting program is in preparation and a large attendance anticipated.

An amusing skit was put on about the 1940 gas refrigeration sales plans at the Midwest Gas Association convention in Chicago. This is evidenced by the smiles of these home service directors; reading left to right they are: Jessie McQueen, American Gas Association, New York; Gladys Price, Southern California Gas Co., Los Angeles; Jane Tiffany Wagner, Servel, Inc., Evansville, Ind. and Eliza Stephenson, chairman, American Gas Association Home Service Committee, of Jersey Central Power & Light Co., of Asbury Park, N. J.

Here are members of the cast of the play: "An Industry Salutary to 1940 Gas Refrigeration Sales." Left to right the thespians are: C. W. Hedmark, Servel, Inc., Chicago; R. W. Bramberg, architect of Chicago: H. D. Valentine, Peoples Gas Light & Coke Co., Chicago; Grant Fink, Servel, Inc., Chicago; Reid Cameron, Servel dealer, Chicago; Bernard T. Franck, Milwaukee Gas Light Co.; William Longstreet, Peoples Gas Light & Coke Co., Chicago; B. H. Whittman, Peoples Gas Light & Coke Co.

Left: John West, secretary of the American Gas Association's 1940 Refrigeration Committee (right) congratulates a newly appointed committee member, A. Kanekelberg, of Denver district new business manager for the Public Service Co. of Colorado. The picture was snapped at the Midwestern Gas Association meeting in Chicago.

Right: B. H. Whittman, domestic sales manager of the Peoples Gas Light and Coke Co. of Chicago, and W. C. Wolff, domestic sales manager of the Brooklyn Union Gas Co., are seen here discussing the 1940 campaign of the American Gas Association Refrigeration Committee at the meeting.

Donaldson Chairman A.G.A. Committee on Personnel Practices

Howard L. Donaldson, of Pittsburgh, Pa., has been appointed chairman of the Committee on Personnel Practices of the American Gas Association by Walter C. Beckjord, president of the Association. Mr. Donaldson is director of personnel of the Philadelphia Company and its subsidiaries, which include the Duquesne Light Co., Equitable Gas Co., Pittsburgh Railways Co. and other organizations.

The Committee on Personnel Practices is now in its fourth year as an Association activity. It plans to make important studies of industrial relations problems of the gas industry. Previous work included the compilation of vital data on existing practices and the sponsorship of outstanding speakers at Association meetings.

A graduate of Washington and Jefferson College in 1919, Mr. Donaldson became affiliated with the Philadelphia Company on April 11, 1924. He is well fitted to assume the leadership of the A.G.A. personnel program, having specialized for a number of years on labor and related problems.

F. M. Goodwin Elected Chairman of A.G.A. Technical Section

The Executive Board of the American Gas Association at its January meeting elected Fred M. Goodwin, Vice President of the Consolidated Gas Company of Boston, Chairman of the Association's Technical Section; Mr Goodwin thereby becomes a sectional vice president of the Association and a member of the Board.

This action was necessary due to the inability of Alex M. Beebee of the Rochester Gas & Electric Corporation to continue in office and the desire of the Section's Vice Chairman, Mr. D. P. Hartson, Equitable Gas Company, Pittsburgh, to continue in his present capacity.

The Executive Board feels that the Association is fortunate in securing Mr. Goodwin's services because in addition to having served as the immediate past chairman of the Technical Section he has had long and active contacts with its activities and continues to bring to the industry the results of 44 years of experience in the gas business. Mr. Goodwin was elected Vice President of The Boston Consolidated Gas Company in 1922 and is a member of numerous organizations and a past president of the New England Gas Association.

Tampa Gas Co. Directors Elect Officers

Roscoe Nettles was re-elected president and general manager of the Tampa Gas Company at a meeting of the Board of Directors held on February 7. E. P. Taliaferro was elected vice-president; H. P. Anderson, treasurer, and Mrs. A. B. Smith, secretary.

R. V. Wayne was appointed assistant secretary; J. C. Huskisson, new business manager; Lambert Frederick, general superintendent, and Frank V. Shafer, superintendent of distribution.

Hulcy and Schmidt Elected Officials of Lone Star Gas Co.

D. A. Hulcy of Dallas, since 1936 executive vice president of Lone Star Gas Corporation, Feb. 12 was elected by the board of directors to the presidency of the corporation, succeeding the late L. B. Denning, who died Feb. 6. With the elevation of Mr. Hulcy, it was also announced that Elmer F. Schmidt, chairman of the natural

D. A. Hulcy

Elmer F. Schmidt

Photos: Parker-Griffith

gas section of the American Gas Association and vice president and operating manager of Lone Star Gas Company, the pipe line division of the system, had been elected a vice president of Lone Star Gas Corporation.

Mr. Hulcy's election places him at the head of Lone Star Gas System which serves more than 300 towns in Texas and Oklahoma and includes the following companies: Lone Star Gas Company, Community Natural Gas Company, Texas Cities Gas Company, Dallas and County Gas companies, Fort Worth distribution division of Lone Star, Lone Star Gasoline Company, and the Council Bluffs (Iowa) Gas Company.

Mr. Hulcy's career with Lone Star started in 1920, in the accounting department. In 1924 he was appointed chief clerk of this department, and early in 1928 was made assistant comptroller for Lone Star, in charge of all accounting matters for all of the underlying companies of the corporation. From this position he was advanced to assistant to President Denning in November, 1929 and in this capacity had general supervision of all accounting matters pertaining to the corporation and all of its underlying companies. In 1935 he was elected a director and vice president of the Lone Star Gas Corporation, and in 1936 was elected executive vice president of the corporation.

Mr. Schmidt has been with Lone Star since 1918 when he helped organize the gas measurement department of the company. In 1919 he was made chief engineer and in 1920 general superintendent of Lone Star. In 1935 he was elected to the board of directors of Lone Star Gas Company. In 1936 he was elected a vice president of the pipe line company and in 1937 he was also made operating manager of the company.

May Elected President

Chester L. May, Dallas, executive vice president and general manager of Community Natural and Texas Cities Gas Companies, was elected president of this large gas distribution system by the board of directors in meeting February superintendent, and Frank V. Shafer, 19. Mr. May succeeds the late L. B. Denning Sr., who, in addition to being president of Lone Star Gas Corporation, also headed the two distribution companies, supplying gas to 170,000 meters in more than 290 towns in north and central Texas and southern Oklahoma.

D. A. Hulcy, recently named to succeed Mr. Denning as president of Lone Star Gas Corporation, has been elected chairman of the board of the Texas Cities and Community Natural Gas Companies, which are served gas wholesale by Lone Star.

Simpson and Travis Complete 25 Years' Distribution Service

February 1 marked an unusual anniversary in the gas distribution department of Consolidated Edison Company of New York. On that day C. C. Simpson, Jr., and G. W. L. R. Travis completed twenty-five years as engineer of gas distribution and as assistant engineer of gas distribution, respectively. They were both appointed to the present jobs on February 1, 1915.

During the quarter century which these two men have headed up the gas distribution department there have been many developments and considerable expansion.

G. W. L. R. Travis (left) and C. C. Simpson, Jr.

At the start of this twenty-five-year period these two men had jurisdiction over 1,467 miles of mains and a department of 645 employees. At present there are more than 2,509 miles of mains and more than 1,300 employees. The number of gas services grew from 128,925 to 191,584.

In this twenty-five-year period Messrs. Simpson and Travis have been instrumental in introducing in distribution work many types of air power tools and mechanical equipment. There has also been considerable improvement in the methods of pumping drips and in locating leaks in the system.

Mr. Simpson joined the company in 1904 in the engineering department. He was commissioned captain of engineers in November, 1917, and served with the American Expeditionary Air Forces in France until the latter part of 1918.

Mr. Travis joined the company on February 1, 1915.

The A.G.A. Domestic Gas Range Committee Presents an Oustanding C P Range Sales Presentation

Davis M. DeBard, Chairman of the A.G.A. Commercial Section, following the 1939 A.G.A. Convention, appointed outstanding leaders of the CP range sales field to head up the Domestic Gas Range Committee, with the specific request for a thorough investigation and report of the health-giving and food-saving features of modern gas cookery.

The need for some enlightenment on this subject was keenly felt in our industry, as evidenced by the varying claims made by the different utilities and manufacturers on the possible food savings of the CP gas range.

Under George Scofield as Chairman of the Domestic Gas Range Committee, working with R. S. Agee, Field Promotion Manager for the CP range, work has progressed rapidly during the last three months, with the result that an imposing array of authentic information and data brings forth startling facts regarding the benefits available to the customer through using gas as a cooking fuel when properly interpreted by the CP gas cooking equipment.

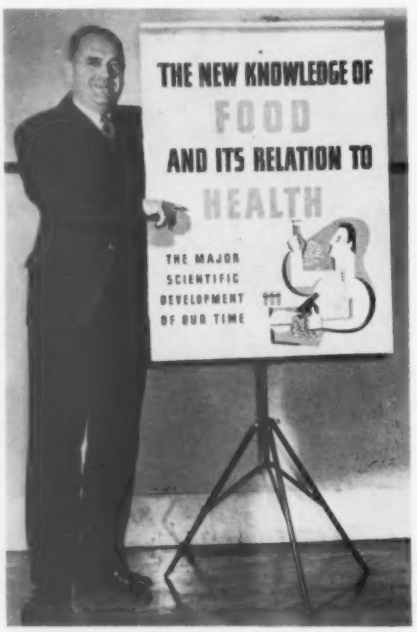
In setting up these facts, they have had the complete cooperation of the Home Service Committee, through its Chairman, Mrs. Eliza Stephenson, and through Ruth Soule, Chairman of the Sub-Committee on Food Savings.

Despite the fact that the average food consumption is 1 ton of food per person per year, or more than 4 tons of food for an average family per year, the amazing fact was disclosed that few people are prepared to give logical reasons why they eat what they eat. This lack of sufficient familiarity with requirements for a balanced diet forces leading American dietitians and doctors to conclude that "practically every disease to which man is heir is directly dependent on improper food selection and preparation." For this reason, the eminent Dr. Wiley points out that there is reason to believe that "Food is the Medicine of the Future." One thing all dietitians agree upon is that we should "Look to Foods rather than Medicine for the Important Health-giving Minerals and Viatmins obtained from Vegetables and Meats, *If Properly Cooked.*"

The cooperating Committees have, as a result of regional laboratory experiences as well as field tests and individual utility laboratory findings, summed up the outstanding features of the CP range regarding healthful and economical food preparation in their report. This report will be issued within the next few weeks in the form of a carefully prepared chart presentation for use before consumer groups such as clubs, women's organizations and schools on request,—and for use "between the acts" in cooking schools and demonstrations.

The suggested speech is augmented by a series of more than forty 4-color charts 30x40 inches in size, bound together and mounted on a light easel for such presentations.

Those who have previewed the first set of hand made charts and heard the first proposed oral report are also enthusiastic over the presentation as a medium for the conducting of group demonstrations in the homes of recent purchasers of CP gas ranges; such club group demonstrations might be staged by either the salesmen or by the home service department after appointments had been made and such home group meetings had been arranged for by the sales force.



George L. Scofield, Chairman, A.G.A. Domestic Gas Range Committee, launching the first introduction of a new approach to modern gas range selling to a group of utility and dealer salesmen. The talk titled "The New Knowledge of Food and its Relation to Health" proves that the C/P range has among its inherent features unusual health preserving food elements and food savings.

So effective has been the work of these collaborating Committees, the American Gas Association has approved the expenditure of producing over 100 sets of the 30x40 charts for distribution and use throughout the gas industry from coast to coast. Fifty-six sets of these charts and accompanying script will be distributed geographically by loan to the 8 A.G.A. regional managers and the 48 state managers charged with the responsibility of launching the Certified Performance range program in their respective areas. Other sets will be for sale to member companies of the American Gas Association at $25 per set.

Further information on this subject and requests for scheduled meetings may be directed to Mr. J. W. West, Jr., Secretary, Commercial Section, American Gas Association, 420 Lexington Avenue, New York, N. Y.

Pennsylvania Natural Gas Men Meet

The February dinner meeting of Pennsylvania Natural Gas Men's Association was held at the Pittsburgh Athletic Association on February 29, 1940. The program included an address by W. J Grover, Advertising Manager of Surface Combustion Corporation, on "Multiplying Sales Contacts Through Employees."

Mr. Grover has made an unusually complete study of successful programs in use by utilities all over the country to develop sales assistance from operating and general employees of these companies, and offered new, practical and detailed ideas on the subject.

The 1940 Eastern Natural Gas Regional Sales Conference was held earlier the same day and on the following day at the Fort Pitt Hotel.

Oscar M. Havekotte is New President of International-Stacey Corporation

Election of Oscar M. Havekotte of Pittsburgh as President and General Manager of International-Stacey Corporation has been announced by Col. Carmi A. Thompson, Cleveland, chairman of the board of directors of the corporation.

Mr. Havekotte will succeed the late Lewis J. Brown, former president of the corporation, who died January 11, 1940. He will assume his new office February 19.

For the past eight years Mr. Havekotte has been a director and a member of the executive committee of International-

Oscar M. Havekotte

Stacey Corporation. He has spent considerable time in Columbus in connection with those duties, and is therefore well prepared for his new task.

A native of Pittsburgh, Mr. Havekotte attended the public schools in that city, and later the University of Pittsburgh. He became associated with the old Carnegie Steel Company, and has been with that company, and its successor, the Carnegie-Illinois Steel Corporation, ever since, having been Assistant Treasurer of the latter company.

Automatic Controls: The Mercoid Company, 4201 Belmont Ave., Chicago, has recently issued a 60 page catalog No. 400 fully illustrating their controls for heating, air conditioning, refrigeration and various industrial uses. Specifications are complete for each unit and many accessories are included.

1940 Refrigerator Campaign

Plans for a concerted gas refrigerator selling campaign throughout 1940 in which all the gas utilities of New England will participate were received with enthusiasm by the four hundred delegates to the meeting of the sales division of the New England Gas Association held on Feb. 9 at the Statler Hotel, Boston. "Life Begins in '40 for Gas Refrigeration" was adopted as the slogan for the New England drive.

The theme of the Boston meeting—"New Horizons and Sales Opportunities"—was symbolized by a scenic setting back of the speaker's platform which disclosed a ship appearing over the horizon while in the foreground a giant airplane was seen moored at an airport.

Bernard T. Franck, vice-president of the Milwaukee Gas Light Co., and 1940 chairman of the American Gas Association Refrigeration Committee; Louis Ruthenburg, president of Servel, Inc., who is vice-chairman of the Refrigeration Committee, and C. A. Spiegel of the sales promotion department of Servel, were the speakers. Jesse L. Johnson, sales manager of the Providence Gas Co., a member of the Refrigeration Committee, presided.

Mr. Franck, having as his topic "The 1940 Refrigeration Program," said in part: "In the early gas refrigeration days major emphasis was placed on developing a product, the performance of which would compare favorably with competitive equipment. It seems to me that today the shoe is on the other foot; competitive equipment is trying to improve its product so that it matches the operation of the gas refrigerator. Now, Servel, in collaboration with the rest of the gas industry, is charged with the responsibility of maintaining the performance leadership which the gas refrigerator has achieved.

"Some ardent advocate of a refrigeration method other than gas may question our claim to performance leadership. The answer to that is the collective opinion of thousands of users who formerly had employed other types of refrigerators. And, if additional proof is required, witness the efforts of other manufacturers, who with rubber mountings and oil sealed mechanisms, are striving to match the gas refrigerator in silence and long life.

"I urge that every gas sales executive give most careful consideration to a gas refrigeration sales program based on a twelve-month activity. Should he decide to go ahead with such a plan I am sure he will really find out that 'Life Begins in '40 for Gas Refrigeration'."

Under the topic "Refrigeration Sales Rewards," Mr. Ruthenburg stated in part: "The growth of interest and cooperation in refrigeration sales on the part of the American gas industry during recent years may be measured in a rather spectacular manner by contrasting the 3200 salesmen and 11 million meters now registered in the 1940 campaign with the few hundreds of salesmen and 3,810,000 meters which were registered in the initial campaign of 1933.

"It is an obvious fact that betterments in the product, reduced prices, advertising and sales cooperation could have had little real value in the absence of retail selling manpower well organized, well trained, well supervised and well rewarded for exploiting effectively the increased salability of the product.

"By the end of 1933, the year in which the air-cooled Servel Electrolux refrigerator was introduced and seven years after the initial introduction of gas refrigeration, there were in the United States 290,117 users of gas refrigerators. Six years later, as the 1939 records were closed, the number of gas refrigerator owners had increased to 1,278,065.

"In terms of gas consumption household refrigerators account for an added load of approximately 25 billion feet of gas annually.

"Moreover, it is conceded by gas utility executives generally that the gas refrigerator has been the means of retaining a domestic load that in the absence of gas refrigeration, might have been captured by competition."

Mr. Spiegel described the promotion plans of the Refrigeration Committee, declaring that surveys made to date clearly indicate that the 1940 campaign will prove to be the most successful in the history of gas refrigerator selling.

A feature of the meeting was a quiz contest entitled "Stump The Experts" in which the delegates participated, with R. J. Rutherford, vice-president of the Worcester Gas Light Company, as chairman.

A.G.A. Refrigeration Sales Drive

Outstanding gas refrigerator sales accomplishments in the first month of the current American Gas Association Refrigeration sales drive have placed twenty-six gas companies in the first group of "Leaders of the Month," and 161 salesmen have been awarded cash prizes for their exceptional sales work, according to Bernard T. Franck, chairman of the American Gas Association Refrigeration Committee.

"It is significant that the great number of sales closed in January," said Mr. Franck, show that refrigeration can be sold all the year round.

"Twenty-six gas companies have been honored with the distinction of being known as 'Leader of the Month,' which is a new distinction in this year's campaign for those companies who turn in the greatest number of sales for their respective classifications."

The winning gas companies in the "Greatest Number of Installations per 10,000 Meters" in their respective divisions are: Division 1—Kings Appliance Corporation, Brooklyn, New York; Division 2—Brooklyn Borough Gas Co., Coney Island, New York; Division 3—Florida Public Utilities Co., West Palm Beach, Fla.; Division 4—Mobile Gas Service Corp., Mobile, Ala., and Division 5—Macon Gas Company, Macon, Ga.

In the "Greatest Total Installations Reported" the following companies with their respective divisions were winners: Division 1—Brooklyn Union Gas Co., Brooklyn, New York; Division 2—Brooklyn Borough Gas Co., Coney Island, New York; Division 3—Central Illinois Light Co., Springfield, Ill.; Division 4—Michigan Consolidated Gas Co., Grand Rapids, Mich.; Division 5—Macon Gas Company, Macon, Ga.; and in Division 6—Tex-Mex Natural Gas Co., Houston, Texas.

The following companies with their respective divisions were winners in the "Greatest Per Cent of Increase in Installations Over the Reported 1939 Installations": Division 1—Kings Appliance Corporation, Brooklyn, New York; Division 2—Minneapolis Gas Light Company, Minneapolis, Minn.; Division 3—Western United Gas & Electric Co., (Elgin Division) Aurora, Illinois; Division 4—Republic Light, Heat & Power Co., Tonawanda, N. Y.; Division 5—Texas Natural Gas Utilities, Houston, Texas; and Division 6—Tex-Mex Natural Gas Co., Houston, Texas.

In the "Greatest Per Cent of Replacements of Outmoded Automatic Refrigerators Against Total Installations Reported" the following companies were winners in their respective divisions; Division 1—Boston Consolidated Gas Co., Boston, Mass.; Division 2—Brooklyn Borough Gas Co., Coney Island, New York; Division 3—Manchester Gas Company, Manchester, New Hampshire; Division 4—Arkansas Louisiana Gas Co., Little Rock, Ark., and Division 5—The Ohio Fuel Gas Co., (Parma Group) Elyria, Ohio; The Ohio Fuel Gas Co., Fremont, Ohio, and The Owensboro Gas Company, Owensboro, Kentucky.

In the "Greatest Number of Individual Retail Installations Sold at the Prevailing Retail Prices and Under the Policies of Each Company" the winner was Southern California Gas Co., Los Angeles.

In the "Greatest Number of Installations Per 1,000 Meters" the Tex-Mex Natural Gas Co., Houston, Texas, was the winner.

Moore Steam Turbine Corporation Becomes a Division of Worthington

The Worthington Pump and Machinery Corporation announces that, effective January 2, 1940, its subsidiary, the Moore Steam Turbine Corporation, of Wellsville, New York, will be conducted as the Moore Steam Turbine Division of the corporation.

The Moore Steam Turbine Corporation was a wholly owned subsidiary of the Worthington Pump and Machinery Corporation for three years, during which the corporation's nation-wide sales organization with its service facilities has increased the volume of steam turbine sales to a point where it has been necessary for the corporation to provide additional plant capacity. A new manufacturing building and new equipment are about ready for use.

The Ancient and Modern in Appliance Display

The old and the new in gas appliances and appliance display are compared here. The upper picture shows the Olean (N. Y.) office of the Keystone Gas Company as it appeared in 1900 and below as it looks today. The change was of course the result of gradual transition from year to year.

Now the Olean office of the Binghamton Group of the Columbia System, it is shown as it appeared during the past Christmas season with a revolving table in the background.

During the summer the same turntable was used to display an old fashioned and a modern kitchen set up back to back. It aroused much interest and favorable comment.

Data and illustrations are from *The Gas Flame* the Company's Employee publication. K. C. Wilson is manager of the Olean district which serves an area with a population of about 75,000 people.

Churchill Elected to Office with Niagara Hudson

Howard B. Churchill has been elected an assistant controller of Niagara Hudson Power Corporation by the board of directors, it was announced in February. He was formerly assistant controller of New York Power and Light Corporation, an operating company of the Niagara Hudson System.

Mr. Churchill entered the auditing department of the former Adirondack Power and Light Corporation at Schenectady in 1923 and was later traveling auditor for Mohawk Hudson Power Corporation and general auditor of New York Power and Light Corporation. He had been assistant controller of New York Power and Light Corporation since 1932.

Testing Heating Appliances for Use with Liquefied Petroleum Gases

Appropriate additions and revisions making possible approval of central heating gas appliances, space heaters and conversion burners for use with liquefied petroleum gases and butane-air gas, were added to the respective American Standards by the action of the A. G. A. Approval Requirements Committee late last year. These recommended revisions are now in the hands of the American Standards Association for acceptance as American Standards and it is expected they will be published before April 1, 1940. At that time they will be distributed to the interested manufacturers in the usual manner.

In accordance with the usual procedure, manufacturers of such equipment, if they so desire, may now have their new models tested under these revised requirements in advance of the time, January 1, 1941, when they go into effect. A large number of manufacturers will undoubtedly wish to secure approval of their products according to these new requirements in advance of their effective date. Anyone desiring information on this point may obtain it from the A. G. A. Testing Laboratories, 1032 East 62nd Street, Cleveland, Ohio.

The Natural Gas and Petroleum Association of Canada

The Natural Gas and Petroleum Association of Canada will hold its Seventeenth Annual Convention at the Hotel London, London, Ontario, on May 30th and 31st.

The Business Session, which is the opening meeting of the Convention, will be held on Thursday evening, May 30th, for the presentation of reports, appointment of committees and the transaction of other business.

Sessions will be held on the morning and afternoon of Friday, May 31st, at which a programme of papers, discussions and a questionnaire on some of the problems confronting the industry will be presented.

The Convention will be brought to a close with the Annual Banquet on Friday evening, May 31st, at which there will be pleasing entertainment and a speaker of international reputation.

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Obituary

L. B. DENNING

Leslie Burke Denning, founder of the Lone Star Gas Company and its president since 1915, died in Dallas, Texas, on February 6th.

Mr. Denning was born near Greensburg, Ind., and as a youth began work as a car checker in the railroad yards of the Cincinnati, Hamilton & Dayton Railroad, in Cincinnati. He continued in railroad work until 1901, in the meantime studying law. He was admitted to the bar in 1899.

While practicing law in Ohio Mr. Denning became associated with the Ohio Fuel Supply Company, and in 1918 became its vice-president in charge of distribution. Later he was an official of the Fayette County Gas Company, of Pennsylvania, and then of the Northwestern Ohio Natural Gas Company.

He was president of the American Gas Association in 1935-'36, and under his leadership the gas industry made rapid strides. He was responsible for the formation of technical groups to work with manufacturers of gas appliances in order to bring about standardization of equipment and promote usage of both natural and manufactured gas in commerce and industry as well as in the home.

C. M. CARBONELL

Cornelius M. Carbonell, retired assistant secretary of the Consolidated Edison Company of New York, died at Miami Beach, Florida, on January 28. Funeral services were held in New York City on February 1.

Mr. Carbonell was born in Havana, Cuba, on October 7, 1867. He retired as assisant secretary of the Consolidated Edison Company on November 1, 1937, with almost fifty years of service to his credit.

JOHN TONKIN

John B. Tonkin, former president of the Peoples Natural Gas Co., Pittsburgh, Pa., died of influenza at Miami Beach on January 26 at the age of 64. He had served as president of the gas company from 1933 to 1936. Mr. Tonkin went to Pittsburgh in 1902 and served as treasurer of the Hope Natural Gas Co., becoming vice president and general manager of the Peoples company in 1918.

He was a past president and director of the Pennsylvania Natural Gas Men's Association.

J. C. COLLINS

Joseph C. Collins, former treasurer and secretary of Rochester Gas & Electric Corporation, passed away at Miami, Florida, on January 31 at the age of 76.

He retired from active duty in August 1940, having been with the company since 1907.

WILLIAM H. WRIGHT

William Henry Wright, a former vice-president of the Semet-Solvay Engineering Corporation, New York, died February 24th at his home in Mountain Lakes, N. J., at the age of 61.

Mr. Wright, who was born in Hudson, Wis., was educated in the public schools of that town and in Dresden, Germany, and the University of Minnesota. After being employed for some time by the Otto Hoffman Coke Oven Company of Minnesota Mr. Wright came to New York and was associated with the Foundation Company. In 1930 he joined the Semet-Solvay Corporation.

He was a member of the Iron and Steel Institute, and the American Society of Mechanical Engineers.

EARLE D. MOILES

The host of friends of Earle D. Moiles will regret to learn of his death on February 5, from the effects of pneumonia complicated by a heart condition. Mr. Moiles was associated with the Merco Nordstrom Valve Co., a subsidiary of the Pittsburgh Equitable Meter Co., and at the time of his death, was manager of the Pittsburgh operations of the Valve Company.

Earle D. Moiles

Mr. Moiles was a graduate mining engineer of Stanford University and practiced his profession for many years in the western states, Canada and Mexico. He was employed by the Merrill Company, an engineering firm of San Francisco, at the time they decided to manufacture the Nordstrom Valve. He was then assigned to the Merco Nordstrom Valve Co. in an engineering capacity and, as their operations expanded, was placed in charge of their eastern factory, first at Belleville, New Jersey, and then in Philadelphia, Pa., later being transferred to Pittsburgh.

CLIFFORD E. FOX

On January 16, Clifford E. Fox, superintendent of the Citizens Gas Co. of Hannibal, Mo., died at the age of 64 after 14 years service with that company. He had formerly been with the Battle Creek Gas Company and the Benton Harbor-St. Joseph Gas & Fuel Co. serving in the capacity of superintendent with each.

T. R. THOMPSON

Thomas R. Thompson, assistant to Will C. Grant, advertising director of the Lone Star Gas System of Dallas died on January 25 at the age of 41. His death followed an appendectomy. Complications from World War injuries hastened his end. He was extremely popular among his associates and with the newspaper fraternity.

Koppers Affiliate Awarded Contract

Koppers-Rheolaveur Company, an affiliate of Koppers Company, has been awarded a contract by the Jones and Laughlin Steel Corporation for the installation of a Koppers-Rheolaveur coal washing plant and extensions to the present conveying, crushing and storage system at its Hazelwood by-product coke plant in Pittsburgh.

The installation will have a capacity of 6,000 tons per day. Amount of the contract was not announced. The plant is to be ready for operation within five months.

Recording Thermometers. A 40-page booklet describing a complete line of recording thermometers for every industrial use, has just been issued by The Foxboro Company, Foxboro, Mass. The booklet is illustrated with more than 70 photographs of thermometers, their parts and accessories, and installation details. Principles and construction of the new Monotherm system incorporated in all Foxboro recording thermometers are explained in detail.

The four classes of recording thermometers discussed are: Vapor pressure; gas pressure; liquid expansion with bimetal coil compensation; and liquid expansion with twin-unit compensation. Characteristics of thermometers of each type are given, including response, accuracy, temperature limits and thermal system of the instrument. Detailed specifications of standard bulbs for each group are also included.

EMCO Regulators: In colorful presentation, Bulletin 1059 of Pittsburgh Equitable Meter Co. describes the applications, performance, operation and construction of EMCO "1001" regulator for "a thousand and one uses in the gas industry." Blueprint showing details and a capacity graph and table are included.

In bulletin 1055 the EMCO pilot loading system of pressure regulation is equally well displayed in color and described in detail. Features of construction and required specifications are given. These informative bulletins will interest every distribution and industrial engineer. Copies of both sent on request to home office, Pittsburgh, Pa., or any branch office.

A. F. Rice Will Manage Occidental Stove Co.

A. F. Rice, Manager of Market Development for the Southern California Gas Company, has left that organization to take over the management of the Occidental Stove Company of San Francisco, successors to Steiger and Kerr Stove and Foundry Company.

Mr. Rice has been associated with the Southern California Gas Company since June, 1937, specifically devoting his attention to trade activities; also has been active since the inception of CP program, nationally, as a member of the Domestic Range Committee, American Gas Association, and as Regional Manager for National CP Promotional organization for Arizona, Utah, Idaho, Nevada, British Columbia, Washington, Oregon and California. He is chairman of the Pacific Coast Gas Association Sales and Advertising Section this year, and will continue in that capacity.

Gas Exhibits, Inc. Announce New Officers and Directors

Election of the 1940 officers and members of the board of directors of Gas Exhibits, Inc., which sponsors the "Court of Flame" exhibit at the New York World's Fair has been announced from the organization's national headquarters at 4 Irving Place, New York City. This year's board is somewhat larger than that of 1939, with seven newly-elected members and eighteen members re-elected.

Hugh H. Cuthrell, vice-president of the Brooklyn (N.Y.) Union Gas Company, was re-elected president. H. N. Ramsey, president of the Welsbach Company, Gloucester City, N. J., who was on the board in 1939, was elected vice-president; N. T. Sellman, assistant vice-president of the Consolidated Edison Company of New York, re-elected treasurer, and Charles Nodder, of New York, elected secretary and comptroller.

The officials and board members of Gas Exhibits, Inc., comprise executives of leading American gas utilities and manufacturers of gas appliances and accessory equipment.

Directors newly-elected and their company affiliations were: C. W. Berghorn, managing director, Association of Gas Appliance and Equipment Manufacturers, New York; N. B. Bertolette, president, Hartford (Conn.) Gas Co.; W. E. Derwent, vice-president, George D. Roper Corp., Rockford, Ill.; W. F. Rockwell, president, Pittsburgh (Pa.) Equitable Meter Co.; F. J. Strickler, vice-president and general manager, Kansas City (Mo.) Gas Co.; T. R. Weymouth, vice-president, Columbia Gas & Electric Corp., New York, and H. Carl Wolf, president, Atlanta (Ga.) Gas Co.

Those re-elected, other than Mr. Cuthrell, Mr. N. T. Sellman and Mr. Ramsey, were: Frank H. Adams, vice-president, Surface Combustion Corp., of Toledo, Ohio; A. P. Brill, president, Ruud Manufacturing Co., Pittsburgh, Pa.; F. D. Cadwallader, vice-president, Boston, (Mass.) Consolidated Gas Co.; J. D. Creveling, president, Panhandle Eastern Pipe Line Co., New York; Merrill N. Davis, vice-president, Dresser Manufacturing Co., Bradford, Pa.; John A. Fry, president, Detroit-Michigan Stove Co., Detroit, Mich.; A. J. Gonnoud, president, Kings County Lighting Co., Brooklyn, N. Y.

George A. Humphrey, sales manager, General Gas Light Co., Kalamazoo, Mich.; F. X. Mettenet, vice-president, Peoples Gas Light & Coke Co., Chicago, Ill.; I. W. Peffly, vice-president, American Stove Co., Long Island City, N. Y.; F. J. Rutledge, vice-president, United Gas Improvement Co., Philadelphia, Pa.; F. E. Sellman, vice-president, Servel, Inc., New York City; M. L. Sperry, president, Washington (D.C.) Gas Light Co., and H. P. J. Steinmetz, vice-president, Public Service Electric & Gas Co., Newark, N. J.

This year's "Court of Flame" exhibit will embody new features which will add to the attractiveness of the display in various particulars, the announcement stated.

Wailes Dove-Hermiston Offices at Westfield, N. J.

Administrative offices of Wailes Dove-Hermiston Corporation, manufacturers of Bitumastic, Hermastic and other protective coatings, are being moved as of February 10th to Westfield, N. J., where one of their plants is located. District sales office will still be maintained at 17 Battery Place, New York City, their present headquarters.

J. M. Kamps has been appointed district manager for Cleveland with office in the Union Commerce Bldg.

1940 International Acetylene Association Convention

The 40th convention of the International Acetylene Association is to be held in Milwaukee on April 10, 11 and 12. Convention Headquarters will be at the Schroeder Hotel.

The program will include a scientific forum on oxy-acetylene cutting of metals, a series of round-table discussion meetings, and, on each of the three days of the convention, a group of technical sessions, at which will be presented many interesting papers by outstanding technical men and experts in applications of the oxy-acetylene process of welding, cutting, and heat-treating.

York Ice Machinery Corporation Announces Official Changes

Announcement was made in January by the York Ice Machinery Corporation of York, Pa., that the growth in volume of the Company's business during the past year necessitated certain official changes.

William S. Shipley, president of the corporation for the past ten years, was elected chairman of the board of directors and Stewart E. Lauer, formerly vice-president in charge of sales, was elected president. Elmer A. Kleinschmidt was elected executive vice-president and Llewellyn Williams, vice-president in charge of engineering. Samuel J. Shipley was elected vice-president and treasurer, and Vincent K. Keesey was elected secretary.

Mr. Lauer, the new president, is a native of York, Pa., born 1890. He graduated from the University of Pennsylvania with a degree in Mechanical Engineering in 1911. His association with the York organization covers a period of approximately thirty years.

Catalogs

V-Belt Drives: How to select a V-drive using stock belts expressed in terms so that a purchaser or operator without professional engineering training can comprehend them, is covered in a 24-page catalog section on fractional-horsepower V-belt design issued by The B. F. Goodrich Company, Akron, Ohio.

Walworth Ni-Resist Pipe: A bulletin issued by Walworth Company, 60 E. 42nd St., New York, describes a medium-priced, corrosion and heat resistant cast iron pipe recommended for services such as laboratory waste lines, caustic lines, distillates, vapors, gases, and lines carrying weak sulphuric acid at normal temperatures. Made in sizes 1¼" to 8" inclusive.

Chemical properties of Walworth Ni-Resist pipe are listed, together with general applications. The bulletin also describes valves and fittings available in Ni-Resist.

Pressure Regulators. New Bulletin, D1, containing information on a new and improved line of Pressure Controllers is announced by Fisher Governor Company of Marshalltown, Iowa. It features new Wizard Pilot Control Valves for direct and remote control mountings. Outstanding among the many construction features is the new built-in throttling range, adjustable from 1% to 75% of the tube range.

Pressure setting is controlled by a vernier screw which does not require a key or wrench for adjustment. Bourdon tubes are large and highly sensitive—available in either bronze or steel. These controllers can be easily changed from direct acting to reverse acting or vice versa without changing Bourdon tube positions or disturbing control pressure connections. Suitable for pressure ranges up to 10,000 lbs.

Water Heaters: In the Catalog for 1940 of Hotstream Heater Co. will be found the most complete line of Water Heaters made by one manufacturer. In addition to the illustrations, specifications and list prices covering these units will be found the necessary technical information to properly make selections and specifications of water heaters for various needs and requirements. A revised chart showing the cost of water heating with the various different fuels is one of the copyrighted features.

The Catalog will be sent to those writing Hotstream Heater Co., 8007 Grand Ave., Cleveland, O.

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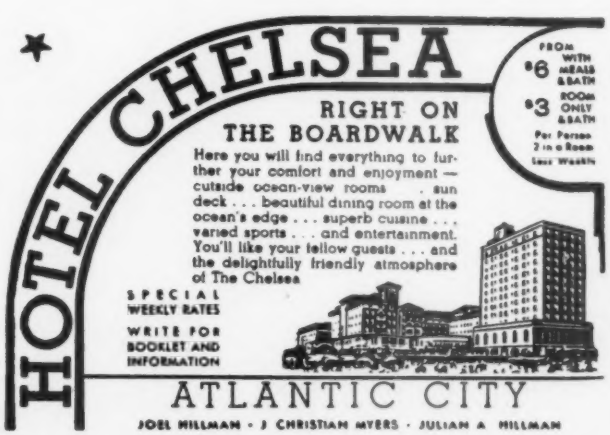
A Book for Gas Appliance Salesmen

Domestic Gas Appliances by A. M. Apmann. Gives practical working knowledge of the technology of appliances and characteristics of fuels. Ranges, Water Heaters, House Heating and Refrigeration are fully discussed. 238 pages, many illustrations, stiff cover. Special close-out price, 50c. American Gas Journal 53 Park Place, New York.

Foreman Wanted

A high grade working foreman is wanted by a water-gas Company in New England. Good wages will be paid. In application full record of experience is necessary. Address Box 116, c/o American Gas Journal, 53 Park Place, New York.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Here you will find everything to further your comfort and enjoyment — outside ocean-view rooms . . . sun deck . . . beautiful dining room at the ocean's edge . . . superb cuisine . . . varied sports . . . and entertainment. You'll like your fellow guests . . . and the delightfully friendly atmosphere of The Chelsea
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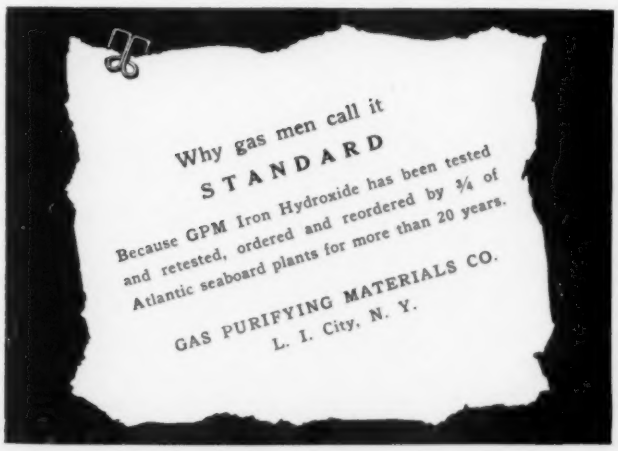

Why gas men call it
STANDARD
Because GPM Iron Hydroxide has been tested and retested, ordered and reordered by ¾ of Atlantic seaboard plants for more than 20 years.
GAS PURIFYING MATERIALS CO.
L. I. City, N. Y.

(Continued from page 9)

Courtesy Davey Tree Expert Co.

Trunk of tree infested by Hickory Bark Beetles. First indication of the presence of these borers is often death of the tree. The small holes from which the adult beetles emerged give a clue to the trouble.

the tree. During a severe winter these none-too-hardy living tissues may be killed, with no outward evidence that anything is wrong. Some twig growth is made, and leaves open up normally only to collapse when the damaged conducting tissue near the base falls behind in supplying water to the expanding top.

Fungous Growth

Several fungous diseases known as "wilts" often cause rapid dying of trees. One of these, the Dutch elm disease, is an epidemic in the metropolitan area about New York City and in parts of New Jersey and Connecticut. Other, similar diseases of elms are more widely distributed. A root disease has caused widespread destruction of elms in Dayton, Cincinnati and elsewhere in the Ohio River valley. However, diseases of the same general type are not confined to elms.

The work of leaf eating insects is easy to distinguish from most tree troubles. However, repeated attacks of defoliating insects so lower the vitality of a tree that it becomes susceptible to borer attack. The canker worm or inch worm is an example of this type of an insect.

Sucking insects—most common of which are aphids and scale insects—are usually minute and liable to escape detection by the untrained observer. They sometimes cause sudden death of a tree but usually produce a slowing down of twig growth and dying of branches throughout the tree which resembles the effects, previously mentioned, of small amounts of illuminating gas in the soil over a long period of time.

Drought

Drought is the cause of more ill health of trees than is recognized by the layman. The widespread droughts of the early thirties killed many thousands of trees and started a cycle of sunscald and secondary diseases from which our trees have not yet fully recovered. Street trees, because of restricted growing space and other environmental handicaps, are usually the first to suffer.

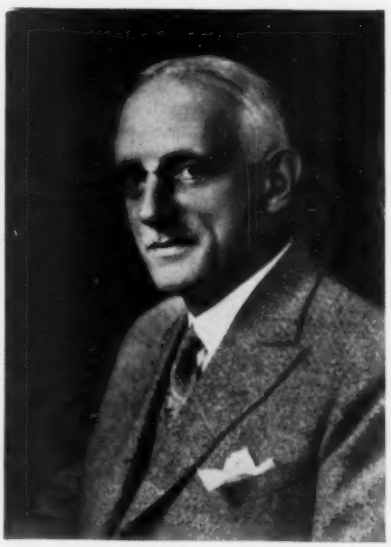
It is well to remember that gas injury which affects the top of the tree will surely have caused injury to the roots as well. This need not show in the large woody roots but can be confined to the small roots and yet be equally disastrous to the tree. It is often difficult to determine the condition of feeding rootlets since at certain seasons they are brown and shrunken to the very ends and may, to the layman, appear to be dead. A growing root has a white tip. The tip is usually only a fraction of an inch in length and is larger in diameter than the brown and shrunken part immediately behind it. Where new root growth is being made freely gas is not present in injurious quantities.

Greater numbers of dying trees are to be expected in midsummer than earlier in the year. The reason for this is not hard to find. During the spring, rains are frequent, and soil moisture is abundant. Because the air is humid and leaf growth incomplete the top does not demand more water than can be supplied, even by injured roots or diseased sap conducting tissue. As summer advances the roots can supply water in lesser amounts from the drier soil while at the same time the mature leaves, in drier hotter air, demand more water. Thus an unfavorable balance between water intake and outgo is liable to show up most noticeably, in middle or late summer, in the form of dead or dying trees. Associated with this, of course, is outright killing of trees by insects and diseases which develop rapidly in summer but are dormant during the winter. Keeping these causes of midsummer decline in mind often gives additional clues when one is attempting to diagnose suspected cases of gas injury.

Gas Engine Compressors: Bulletin L-600-B10 issued by Worthington Pump and Machy Corp., Harrison, N. J., describes angle compressors for refineries, gas transportation lines, recycling and repressuring service, gasoline and refrigeration plants, gas or air lift pumping, etc.

Worthington V. P. Moves to Home Office at Harrison, N. J.

Mr. Charles E. Wilson, Vice President since 1934, in charge of the Pacific Coast Operations of the Worthington Pump and Machinery Corporation, is moving his headquarters to the home office of the Corporation at Harrison, New Jersey, where he will direct the sales of all products handled by the Corporation's Carbondale Division,



Charles E. Wilson

which specializes in air conditioning and refrigeration equipment. In this work Mr. Wilson succeeds Mr. H. A. Feldbush who henceforth will devote his time to the manufacturing department of the Corporation.

Mr. Wilson is also assuming directional charge of the sales of all Corporation's products built at the Holyoke, Massachusetts, factory, consisting of small stationary compressors, portable air compressors, rock drills, contractor tools and turbine well pumps.

Mr. Wilson has been connected with the Worthington Pump and Machinery Corporation for many years in many capacities.

W. S. Arthur Joins Cooper-Bessemer

Together with the announcement that the Cooper-Bessemer Corporation has established sales offices in St. Louis, Missouri, comes word that W. S. Arthur has joined that company and will manage sales engineering activities in the districts served by the new branch.

As manager of Cooper-Bessemer's new St. Louis office, Mr. Arthur will further sales of the company's gas engines, compressor units and diesel engines, which cover a range of 25 to 1500 horsepower and include horizontal and vertical engines, and horizontal, vertical, angle, and V-angle compressor units.

The new Cooper-Bessemer offices are located on the fifteenth floor of the Arcade Building, at Eighth and Olive streets.

HUGHES PRINTING CO.,
EAST STROUDSBURG, PA.

It stays tight

When changes in operating requirements of gas distribution systems called for better joints, cast iron pipe makers adapted the time-tried "stuffing-box" principle to the construction of a leak-proof mechanical joint. Today mechanical-joint cast iron pipe, as developed by our members, has proved its efficiency in hundreds of installations. It is rapidly becoming standard construction in gas distribution systems.

Look for the "Q-Check" registered trade mark. Cast iron pipe is made in diameters from 3 in. to 84 inches.

THE CAST IRON PIPE RESEARCH ASSOCIATION, THOMAS F. WOLFE, RESEARCH ENGINEER, 1015 PEOPLES GAS BUILDING, CHICAGO, ILLINOIS

CAST IRON PIPE

THE STANDARD MATERIAL FOR UNDERGROUND MAINS

Assembling any of the mechanical joints made by CIPRA members is a simple, swift operation with common labor and a single tool. These joints vary in design but are all based on the stuffing-box principle and they are all bottle-tight.

S IMPLICITY OF CONSTRUCTION

P ARTS INTERCHANGEABLE

R EDUCED OPERATING COSTS

A CCURACY IN REGISTRATION

G IVES SATISFACTORY SERVICE

U NIFORM PERFORMANCE

E FFICIENT AND DEPENDABLE IN MANUFACTURED, NATURAL AND BUTANE GASES